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The #1 Apple II Magazine

AUGUST 1987
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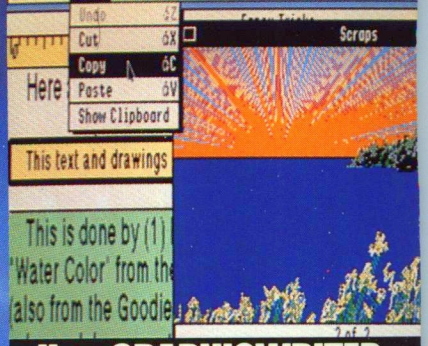

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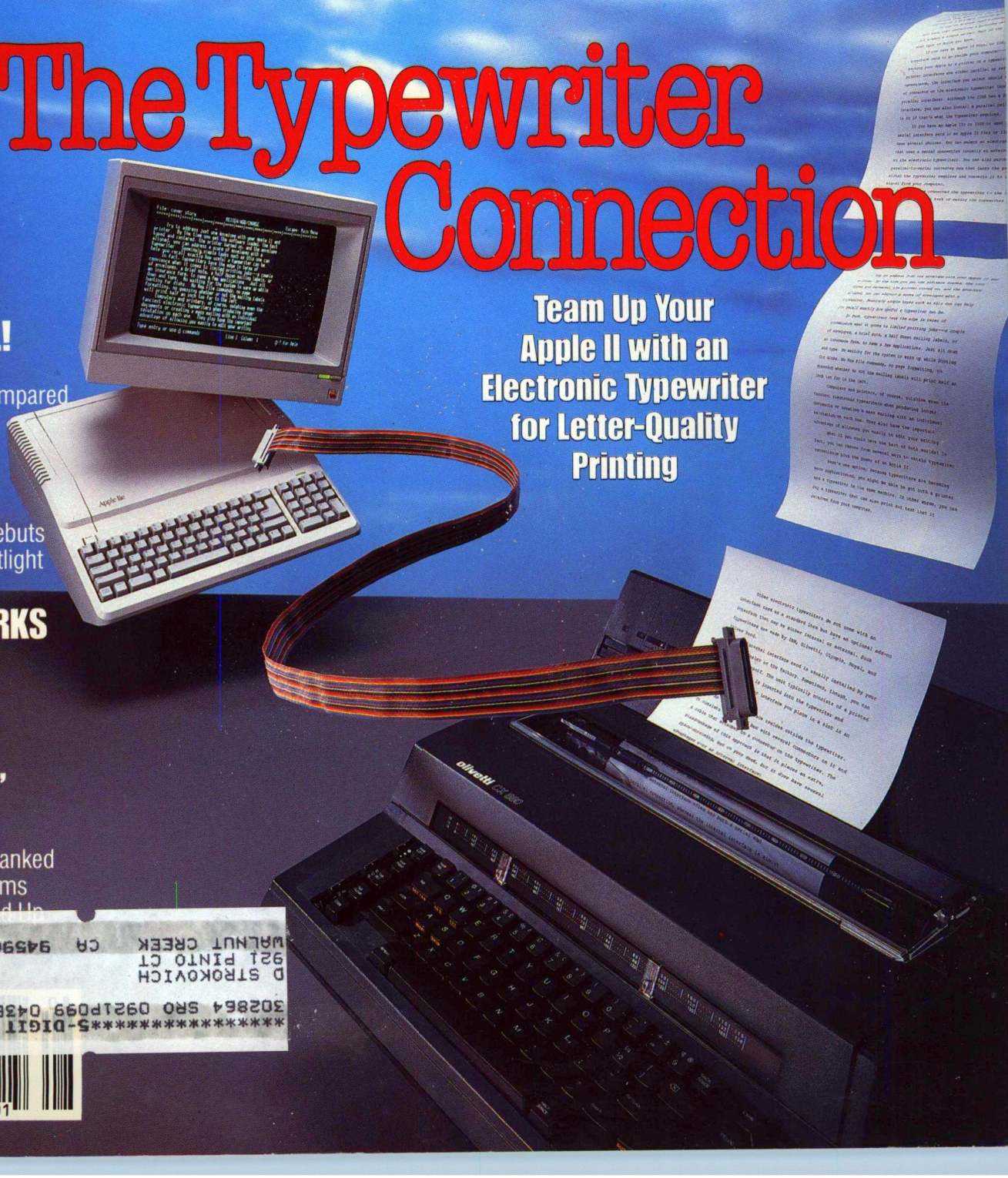

PLAY BALL!
Six Baseball Simulations Compared

SNEAK PREVIEW
Laser 128EX Debuts in Product Spotlight

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How to Use the @IF Function

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14 of the Top-Ranked Algebra Programs for Grades 7 and Up

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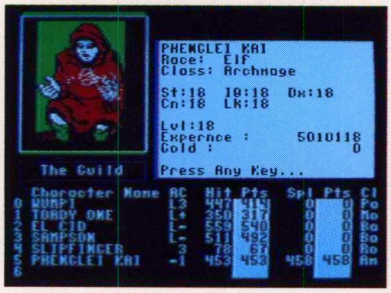

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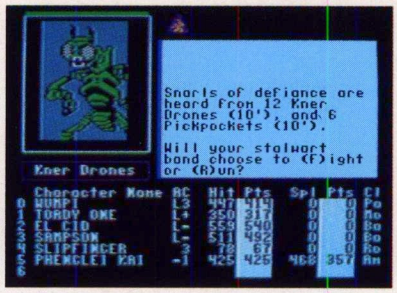

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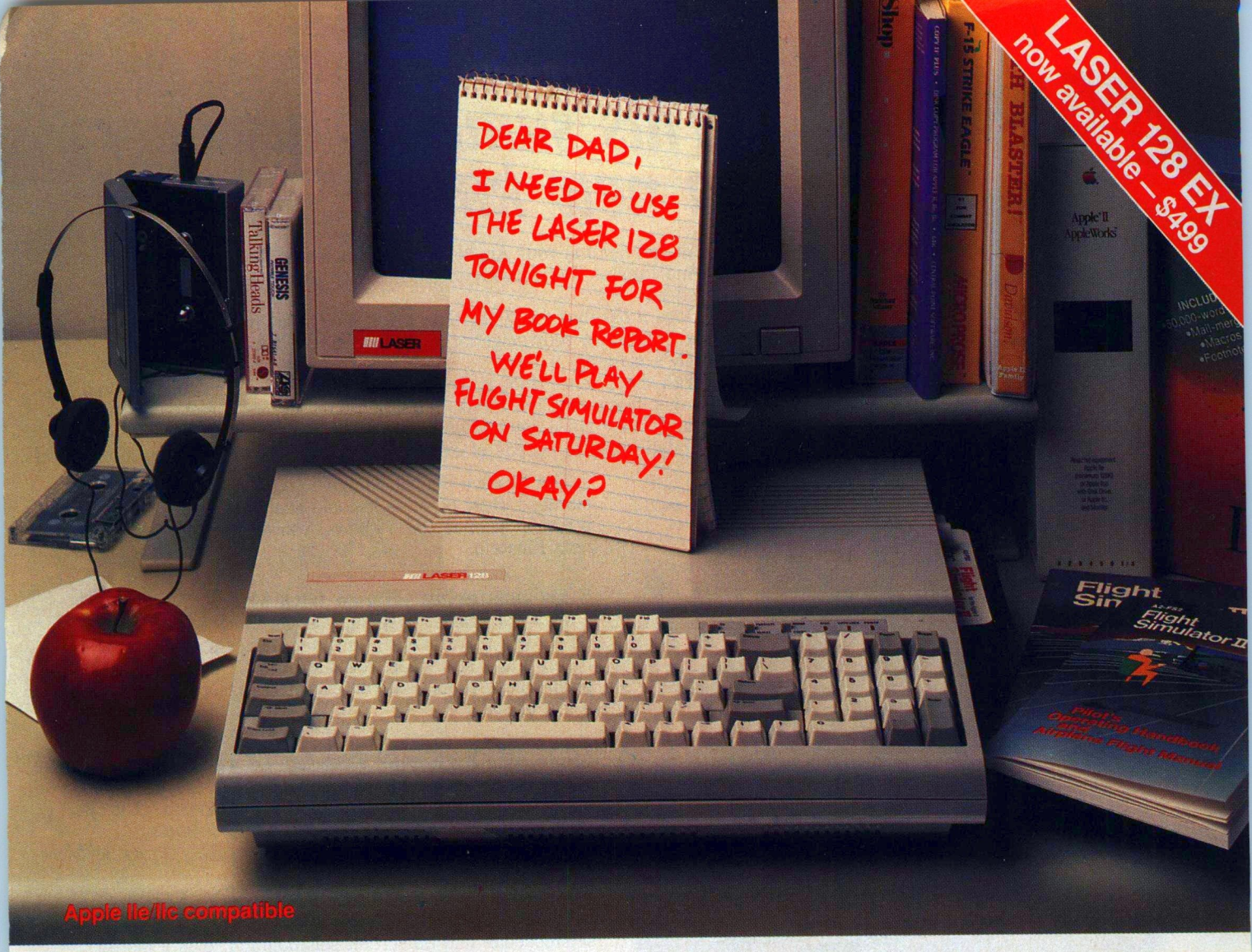

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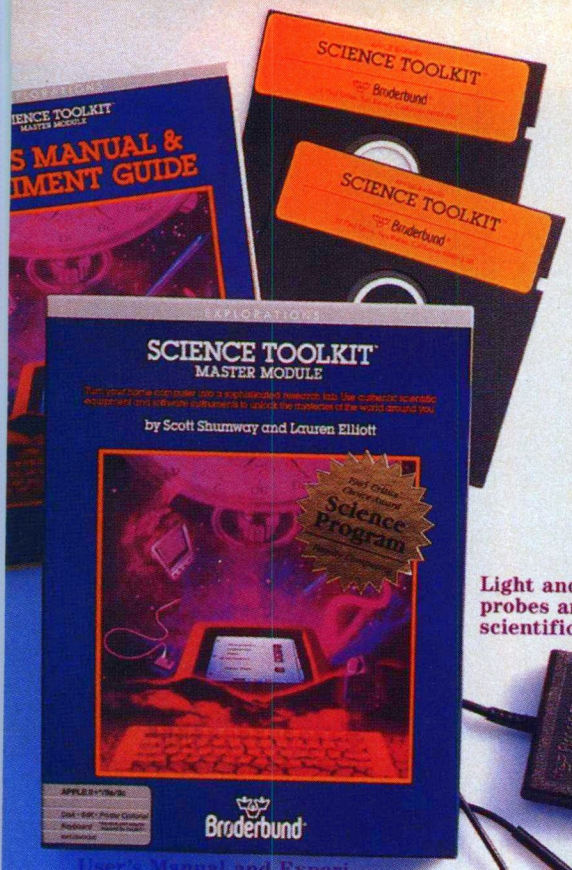

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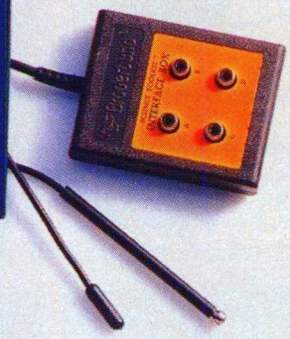

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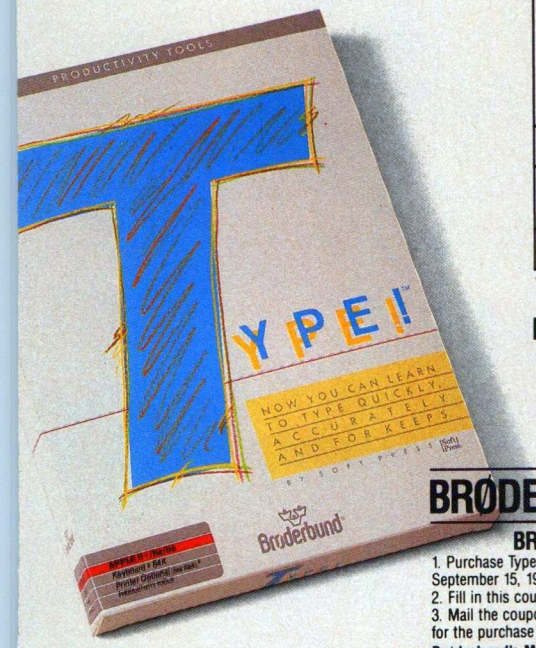

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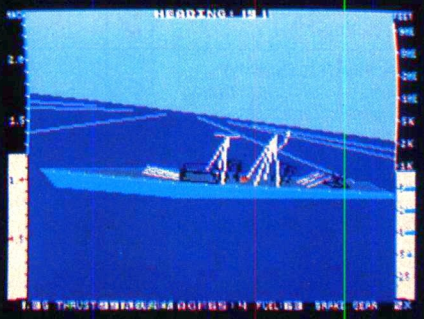

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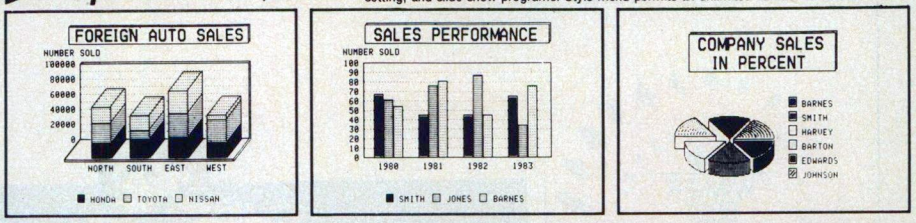

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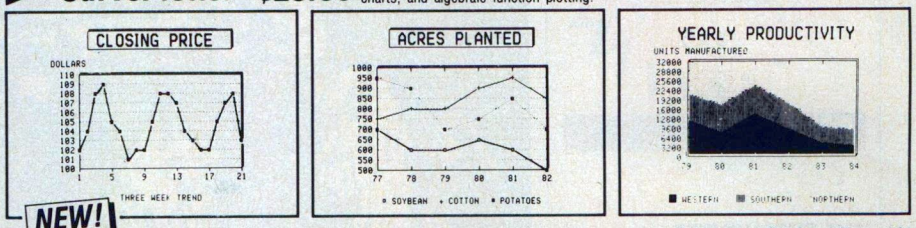

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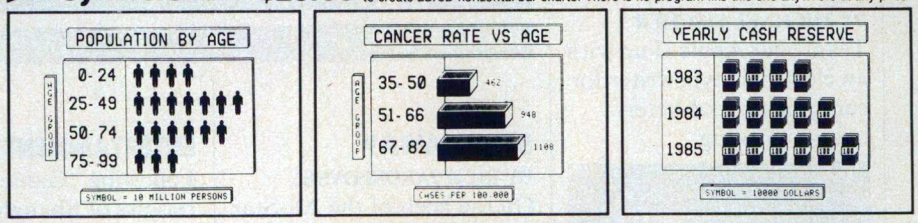

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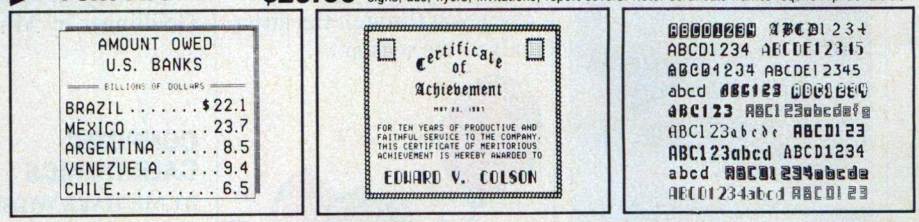

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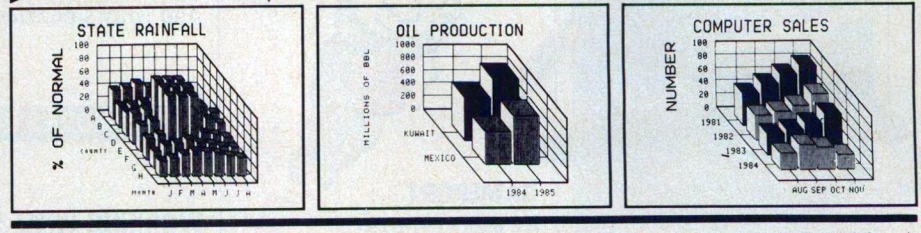

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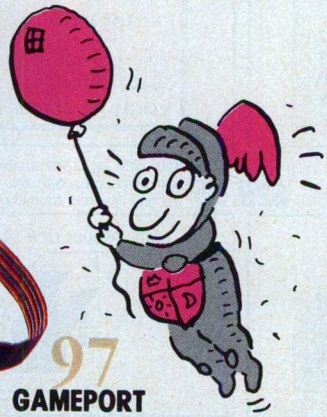

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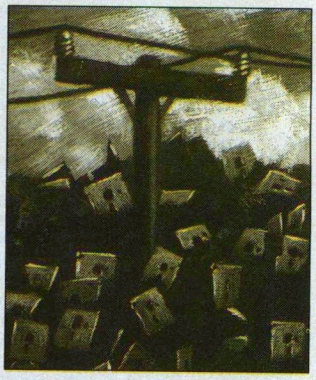

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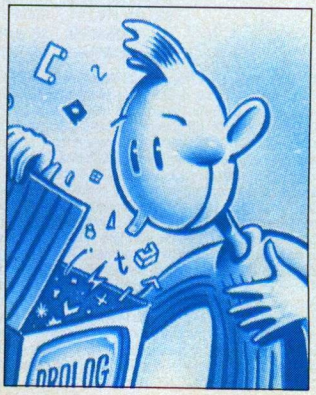

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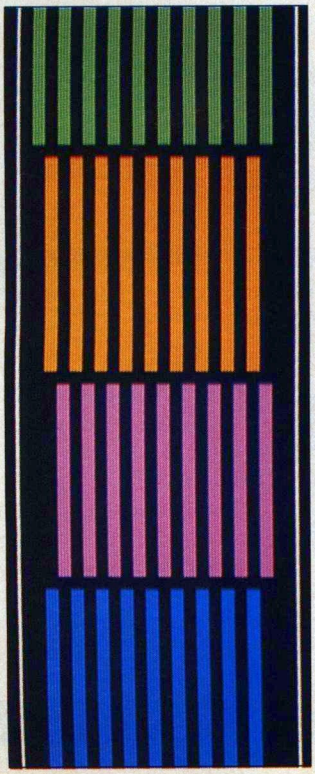
BY ROBERTA SCHWARTZ AND MICHAEL CALLERY
This month, Schwartz and Callery offer a compendium of tips for computer artists.



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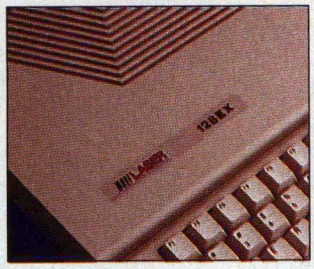

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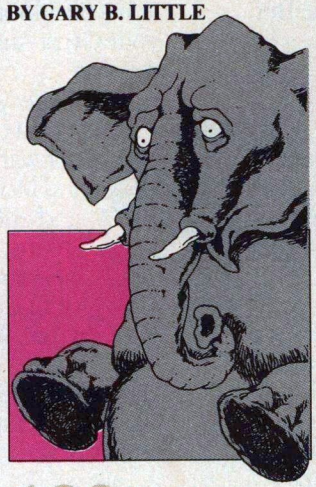

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GRAPHICWRITER
BY DAVID D. THORNBURG
A review of the first "document processor" for the Apple IIGS

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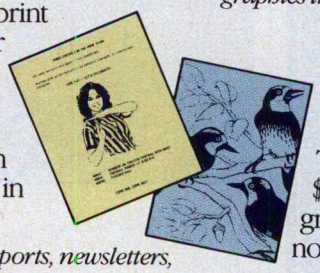

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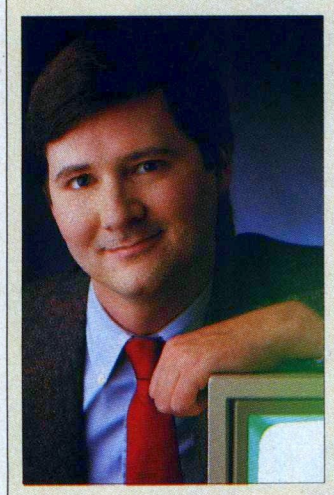
COMMENT BY FREDERIC E. DAVIS



EDITOR'S PAGE

LISTENING TO A FAN

I am an Apple fan. I'm a fan because Apple has a colorful past and is a fun company to speculate about. I'm also a fan because Apple invented the personal computer and is the company that's the most committed to making computers more personal. Another kind of Apple fan is bad news, however: the fan inside the IIGS computer.

Part of Apple's colorful past is, believe it or not, centered on computer fans. In the early days of Apple, most personal computers were noisy things that sounded like a cross between a vacuum cleaner and an airplane taking off. Steve Jobs, cofounder and previous chairman of Apple, decided that Apple computers shouldn't have fans, because he wanted them to be quiet when you were working with them. Jobs ended up carrying his dislike of fans to such an extreme that it started to have negative effects on the design of Apple's computers. Jobs' insistence that the Macintosh not have a fan prevented the system from having a hard-disk drive, a limitation that almost led to the Mac's demise. Once Jobs was gone from Apple, fans (and hard disks) started appearing in the Macintosh line.

The original Apple II, II Plus, and IIe didn't have fans, and, as anyone who's filled up an Apple's slots with cards knows, the computer can malfunction without a fan to keep the computer's innards cooled off. Third-party vendors have made a bundle selling fans for the Apple II; Kensington Microware's popular System Saver fan is often referred to as "the piece Apple forgot," and Kensington's sale of a quarter million fans helps back up that claim.

When Apple introduced the Apple IIGS, that computer had no built-in fan, but Apple also offered an optional internal fan, a small "muffin"-type device that costs about $50 retail. Furthermore, Apple says that if you have three or more cards plugged into slots inside the IIGS, you *must* install a fan or you will be violating your computer's warranty. The problem with this situation is that Apple's fan, although intrinsically fairly quiet, is not electrically isolated from the IIGS's internal circuitry and causes a loud and annoying hum in sounds you create with the IIGS's Ensoniq sound chip. The hum is not very noticeable when you're listening to sound through the IIGS's own internal speaker, but when the sound from the IIGS is amplified and sent to speakers (such as the Bose speakers), the hum becomes unacceptably loud.

The IIGS is a great machine, but Apple still has a lot to learn about fans.

Since the S in GS stands for *sound*, it seems incredible that Apple is shortsighted enough to sell a fan that messes up the computer's sound yet is required if you have more than two cards in the computer. One of the many readers who have written to us about this problem said that when he complained to Apple, he was told to take out the fan and run the IIGS with its top off! I'm sure the FCC wouldn't approve of that advice, since removing the top of the computer can cause radio-frequency interference (RFI) that disrupts nearby television and other broadcasts.

So, what should happen to Apple's IIGS fan? I think Apple should pull its IIGS fan off the market and replace it with another that is electrically isolated from the computer's circuitry. Short of that, the company should put a warning on the current fan stating that it distorts the sound of the

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EDITOR'S PAGE

Apple should put a warning on the current IIGS fan.

IIGS, especially when the sound is amplified. Apple shouldn't have any difficulty creating a fan that doesn't cause sound problems. The Conserver for the IIGS from MDIdeas, for example, contains a fan that does not interfere with the sound. Other external fans may also be OK, but be sure to try them before buying. Furthermore, if Apple wants to be more responsive to customers' needs, it should offer refunds to anyone who bought one of Apple's IIGS fans and wants to use the IIGS for music.

The IIGS's sound is already a bit noisier than it should be, since the electrical traces on the computer's motherboard are located too close to the Ensoniq sound chip's traces, but the very slight distortion will be of concern only to professional musicians. Several solutions to the trace problem are already in the works, including a redesigned motherboard from Apple that won't be available for quite some time. Also MDIdeas is experimenting with a special IIGS sound product that will reduce this noise. The incipient MDIdeas device lets you unplug the Ensoniq chip and plug it into a piggyback board that adds sound capabilities and reduces the electrical-trace distortion and the noise. We'll keep you posted on this situation.

The IIGS is a great machine, and I continue to recommend it as the best computer for home, education, and small business. It's just that Apple still has a lot to learn about computer fans. I hope it listens to this fan and offers a better fan for the Apple IIGS. +

FRED

FREDERIC E. DAVIS/**EDITOR IN CHIEF**

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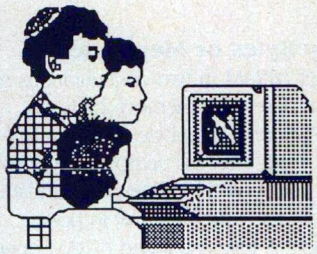

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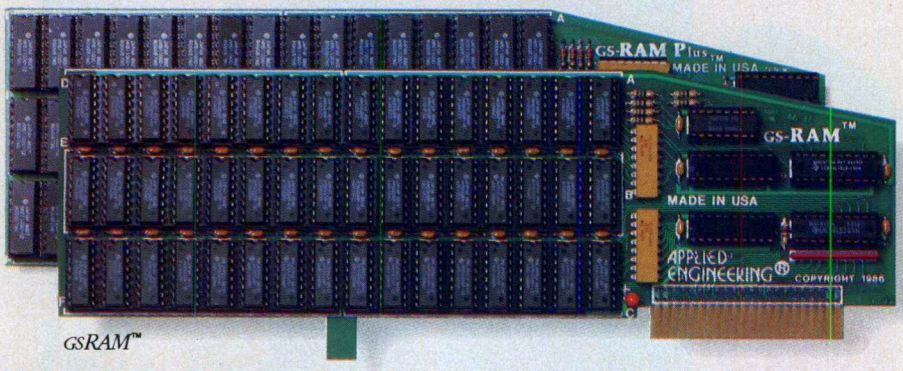

GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

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- Made in USA

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LETTERS TO THE EDITOR

MAIL-ORDER KUDOS

Dear *A+*: Recently, I had two experiences with mail-order companies I want to bring to the attention of your readers.

I was having a great deal of trouble printing from AppleWorks on my Seikosha SP-1000 printer. I called Computer Direct of Barrington, Illinois, from whom I'd purchased my printer. A helpful technical advisor told me to send in my copy of AppleWorks so that he could install a custom printer option. In six days, I had my program back, and it works perfectly. In general, Computer Direct is a very reliable company; I usually have my order in 4–5 days.

When purchasing a second drive for my Laser 128, I called LifeStyle Computer Products of Laguna Hills, California, and ordered a Mitac Ad-3c drive. I received it in five days. The drive worked fine with almost all of my software but failed in applications in which drive speed was critical. I called LifeStyle about my problem, and they offered to send a Maple drive and have UPS pick up the Mitac at no cost. The Maple drive arrived promptly but presented the same problem. When I called LifeStyle again, the salesperson apologized and offered to send a Laser FD-100c drive. By 11 the next morning, the drive was on my doorstep in Nebraska, and my Maple drive was picked up at no cost to me. This is without qualification the best service I have ever heard of. My highest recommendation for LifeStyle Computer Products.

DAN MAHALEK
KEARNEY, NE

Dear *A+*: I would like to bring your attention to two companies that I dealt with while ordering disk drives. They must be commended for their excellent service. The companies are: BCE, 3233 K Street NW, Washington, DC 20007 and Maple Technology Corp., 1120 Stewart Court, Suite B, Sunnyvale, CA 94086. BCE carries inexpensive, half-height disk drives. I ordered two, for a total of $164, and received them promptly—but there was a problem. Neither drive had a potentiometer for speed adjustment. This aspect was critical because my Franklin Ace 1000 makes drives run faster than Apples do. BCE referred me to Maple, who asked me to ship both drives to them for adjustment ($8 shipping). The response was wonderful. Maple added potentiometers to each drive's servo board at no extra charge, and now all of my software runs fine.

GARY M. WEBER
CEDAR CREST, NM

IIc VINTAGE IDENTIFICATION

Dear *A+*: Larry McCarty raises an interesting point in the "Letters" section of the May 1987 issue. He's right when he says PR#7 will boot an external 5¼-inch drive *if* the IIc was built prior to January 1, 1985, and has a serial number less than D510001. Machines made since then have the new 32K ROM featuring a protocol converter in slot 5 that allows the use of a UniDisk 3.5 drive with the IIc, AppleTalk in slot 7, self-test diagnostics, enhanced serial port commands, a mini-assembler, and step and trace functions in the monitor. A PR#6 boots the internal drive, and a PR#5 boots the external UniDisk. When you power the IIc up, it attempts to boot from the built-in drive. If that fails, it attempts to boot the first device attached to the protocol converter. If that fails too, a Check Disk Drive message is displayed, and the system hangs. The IIc 32K ROM machines can be identified by a check of the identification byte at $FBBF. The new machines have a value of $00, and the original IIc has a value of $FF.

DOUG GRUBEN
LOMPOC, CA

PHONE BEFORE ORDERING

Dear *A+*: I would like to thank you and Dan McNeill for the article on mail-order shopping in the March issue. Let me tell you why.

You see, I had already submitted an order to Conroy LaPoint, to the tune of $735. I telephoned the company and, much to my dismay, the operator told me the company was going out of business!

Because of your story, I will now be able to stop payment on the money order, get my money back, and reorder from a more stable company and get the product I want.

JOHN P. BERRYHILL
APO NY

NON-APPLE DRIVE SPEED-ADJUSTMENT CONCERNS

Dear *A+*: I'd like to comment on your "Letters" column in the June issue of *A+*. A reader wrote about non-Apple disk drives and their lack of a speed adjustment. Specifically, the reader mentioned the Laser drive as not having any speed adjustment. We believe this reader may be referring to disk drives under the name Laser that were sold by a California company that is no longer in business.

As a representative of Video Technology Computers—the manufacturer of Laser FD-100 Series drives—I wish to clear up the confusion about adjustments. We do, in fact, have a speed-adjustment control on all of our Laser drives. The speed-adjustment hole is located under the front right drive foot on the plastic-case drives. By carefully removing the rubber or cork foot, customers will be able to adjust the speed without disassembly. The adjustment requires a drive-speed utility program and a small screwdriver.

If you disassemble the drive case, you'll find that the flywheel has both 50- and 60-cycle strobe markings for speed adjust. The speed adjustment is located on the speed-control board (bottom of the drive).

We recommend that customers who are not familiar with speed adjustments take the drive to the dealer or a computer service center for adjustment.

LARRY BARNES
VIDEO TECHNOLOGY COMPUTERS

TAXING DELAYS

Dear *A+*: When I received my March issue of *A+*, the cover really caught my eye. "Taxes! The Apple II Comes to the Rescue." Wow, great—just the thing to wake up an accountant.

I read the article before I did another thing. Frankly, I agree with Steve Mann about everything he says about the HowardSoft program Tax Preparer. This program can be used by both professionals and individuals and really is the Cadillac of those reviewed.

For the professional, however, this program does have a major problem. It is not available until late in the tax season. Does HowardSoft think that an accountant can tell clients that they should bring their information in as soon as possible but that their tax returns won't be ready until after April 15th? Their support people talk about preparing current returns using the prior-year program and translating when the current program is available. This certainly doesn't create good will, lessen the workload, or promote additional business.

When talking to HowardSoft's support people on the 20th of January, I was unable to get a commitment as to a release date. All I got was a lot of talk about how late the IRS was this year. Seems funny that I got my tax forms as early as I did last year. Most of the changes in the tax act relate to 1987 rather than 1986. But then the new form 1040 is one line shorter than last year's, and, of course, the tax tables have changed. HowardSoft leaves a lot to be desired.

DAVID K. LAVOIE
STERLING HEIGHTS, MI

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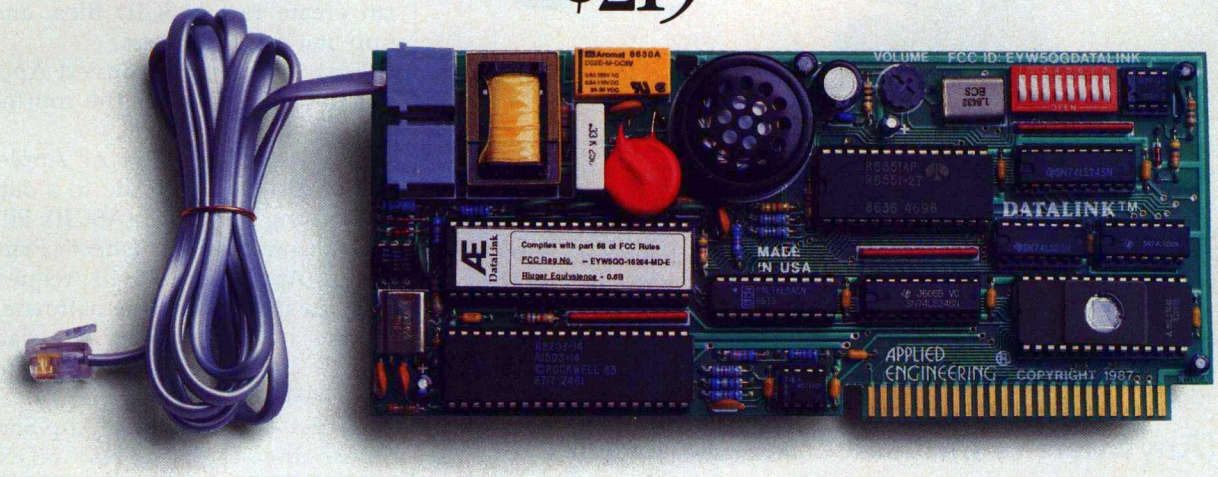

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	Applied Engineering Datalink	Hayes® Smartmodem 1200A
Price	$219	$439
Max. transmission rate	1200 baud	1200 baud
Warranty period	5 years at no charge	2 years or 4 years for $75
Software included	YES	NO
Hayes AT command set	YES	YES
Help screens	YES	NO
On-board telephone jacks	YES	NO
Fits any slot (even with fan)	YES	NO

Smartmodem is a registered trademark of D.C. Hayes Corporation.

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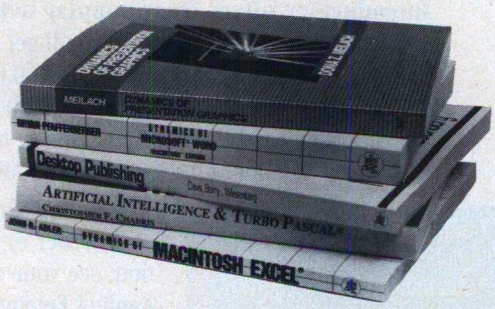
CIRCLE 339 ON READER SERVICE CARD

COMPUTER-EASE



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APP-STAT/APPLEWORKS DATA SHARING

Dear *A+*: In his review of StatSoft's App-Stat program (*A+*, March 1987), Mike Markowitz indicated that this program could not share data with the AppleWorks spreadsheet. In fact, AppleWorks can create text (ASCII) files, and App-Stat can read them.

First, you need to convert App-Stat to ProDOS, using the routine provided.

To get the date out of AppleWorks, just print the file to a data disk, using the Text (ASCII) File option from the spreadsheet's Print menu. AppleWorks will request that you give a complete pathname for the new file, using the data disk's volume name and a filename (e.g., /AW.DATA/TEMPFILE).

To get the data into App-Stat, choose the TRANSFORM NON-STATSOFT FILE INTO STATSOFT FILE option from its Data Editor menu. Here you can dispense with the complete pathname and simply enter the filename (e.g., TEMPFILE). You will also need to tell App-Stat how many cases (subjects or observations) and how many variables (tests) there are in the data file. After reading your ASCII text file, the program will save it according to its own formatting requirements. The same procedures for transferring spreadsheet data can be applied to database files. Whether working from a spreadsheet or a database, the data should be organized in a row-by-column format in which each row or record represents a case and each column or category represents a variable. This form is the logical one within AppleWorks, and it is also the way in which it will be read by App-Stat.

Except in the case of very small data sets, it is almost always preferable to use AppleWorks for data entry and then transfer the data for analysis. App-Stat does have a nice data editor, but it is frankly primitive when compared to AppleWorks.

PAUL G. MATTIUZZI
SACRAMENTO, CA

StatSoft is currently revising the App-Stat manual to include AppleWorks data-transfer procedures. The version of App-Stat that we reviewed contained no mention of AppleWorks compatibility.—Editors

Æ Update . . .

The fastest IIGS memory product on the market is now available with Applied Engineering's GS-RAM and GS-RAM Plus memory cards. AE's GS-RAM and GS-RAM Plus now include a new disk caching feature which can be used independently or with the Apple IIGS RAMdisk. (Although a RAMdisk is faster, disk caching is easier to use.) Caching significantly improves Apple Disk 3.5 access time. The new caching technique uses highly efficient and optimized machine language programs providing ultra fast, state-of-the-art dynamic disk caching in both ProDOS 8 and ProDOS 16 environments. This new enhancement makes GS-RAM and GS-RAM Plus the fastest IIGS memory cards on the market today. Ultra fast disk caching is now included with all GS-RAM and GS-RAM Plus purchases. Current GS-RAM users can obtain an upgrade for $10.

Applied Engineering's DataLink modem is now ready to order with delivery in 2-3 weeks. DataLink is the newest and most advanced internal 1200/300 baud modem available today. DataLink incorporates the latest "modem on a chip" technology. Some of the components are so advanced they did not exist only one year ago. Because slot 2 is the normal location for a modem, Applied Engineering made an extra effort to make DataLink the only internal modem small enough to fit in slot 2 without interfering with the Apple IIGS's built-in fan. DataLink works in the Apple IIe and II+ as well. DataLink includes powerful communications software both in EPROM and on disk. This state-of-the-art modem has a retail price of only $219 and is covered by a 5 year warranty.

New video digitizer is in the final stages of development. Unlike older techniques, Applied Engineering's video digitizer incorporates its own high speed memory which solves many of the problems that the current DMA dependent video digitizers inherently have. Whereas other video digitizers are IIGS only, this new process will allow the Applied Engineering card to also work in an Apple IIe and II+ as well as the IIGS. Video digitizers on the market at present require many video frames in order to digitize a picture. This results in a digitized image that shows tearing or distortion if there is motion when the image is digitized. Applied Engineering's design is capable of digitizing a complete color or black-and-white image in a single frame, thereby eliminating distortion. Because the design incorporates three separate "flash analog-to-digital converters" it can actually digitize to a greater resolution than the Apple is capable of displaying on screen. However, the high resolution image can be reproduced on most printers and the video image is displayed to the maximum resolution on the Apple's monitor. The product should be available in September. A price has not been set but is expected to be in the $250 range.

Nonvolatile GS memory board soon to be released by Applied Engineering. The new card can piggyback to the GS-RAM and GS-RAM Plus cards or be used independently and uses standard dynamic RAM chips. It is available in 1 megabyte and 2 megabyte sizes. The memory on the board can be used as system memory or partitioned as a ROMdisk in 128K increments. If a RamCharger battery back up unit is connected, the memory is non-volatile. There are other techniques for creating non-volatile memory in the Apple IIGS memory expansion slot. One is the use of EPROMS. The engineers at Applied rejected this approach because of the difficulty in programming and reprogramming whenever customers wanted to update their software. The difficulty in programming and changing EPROMs combined with their relatively small memory capacities meant this approach was not acceptable. Another technique is to use SRAMs (Static RAMs) or EEPROMs (Electrically Erasable PROMs). These memory devices are easily programmed by the user but present the disadvantages of relatively small capacity and high cost. AE's solution uses 1 megabyte DRAMs with a battery backed-up refresh circuit. This allows the currently available RamCharger battery back-up unit to be plugged directly into the new expander to give permanent non-volatile storage. The card can also be used without the RamCharger as additional memory expansion. AE's solution has the advantages of large capacity and low cost.

Applied Engineering's new MS-DOS card (code named "Little Blue") is proceeding as planned. AE expects to be shipping product in October or November. Testing indicates that the product will be compatible with approximately 98% of IBM software; all major MS-DOS software is compatible. The card is expected to retail for approximately $500.

Applied Engineering is seeking an experienced 6502 machine language programmer to develop software and firmware for its future line of Apple peripherals. Minimum 2 years Apple programming experience required. Send your resume to Applied Engineering, P.O. Box 798, Carrollton, TX 75006 Attn: Personnel.

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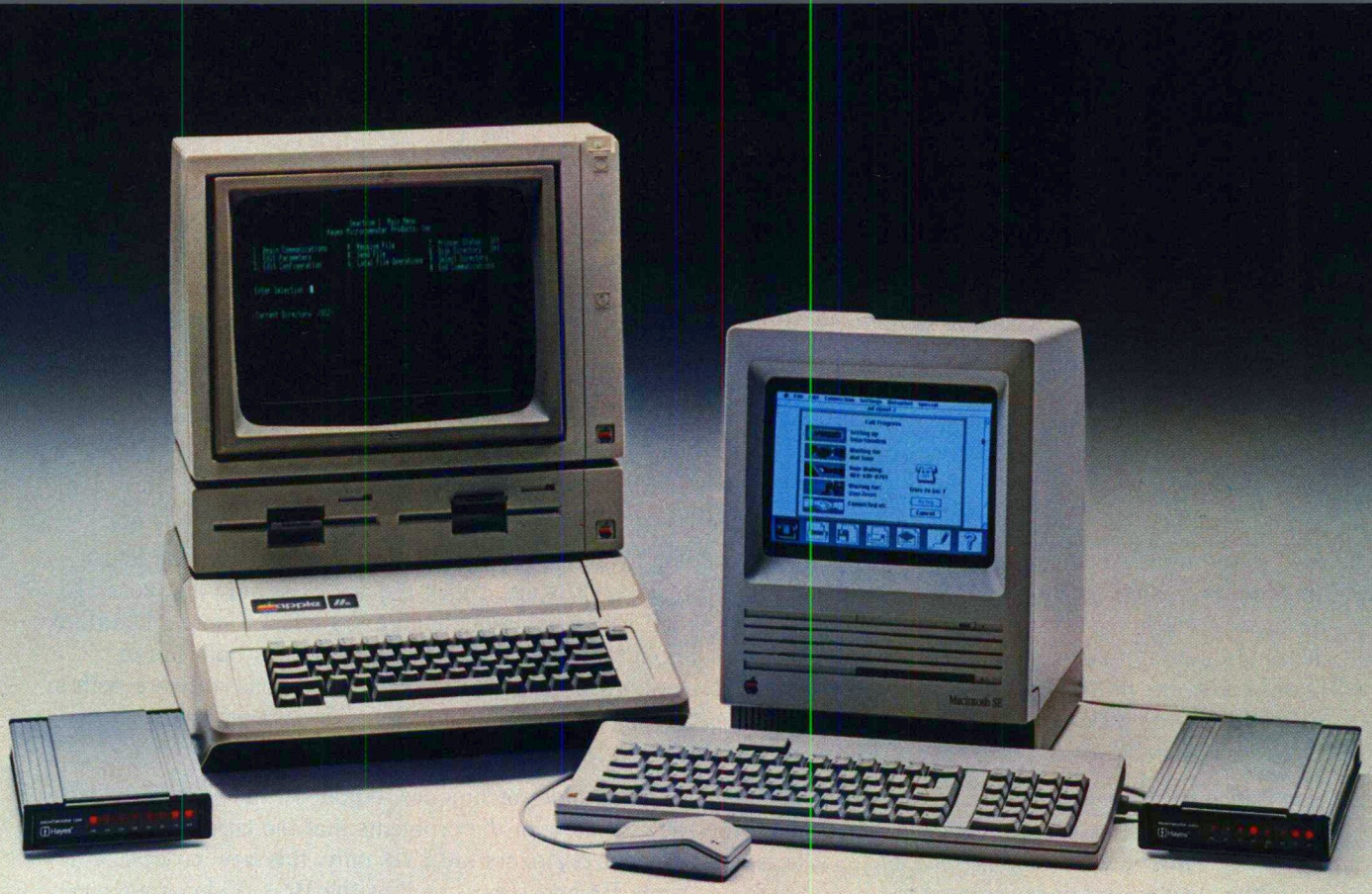

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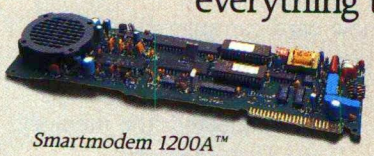

Smartmodem 1200A™

For the Apple II, II+, IIe, IIc and IIGS, we offer the Smartmodem 2400™ and Smartmodem 1200.™ Or the internal Smartmodem 1200A,™ a modem that plugs into Apple expansion slots for fast, economical 1200 bps operation. And our new Smartcom I,® powerful menu-driven software with autodial/autoanswer and XMODEM protocol, brings out the best in both Apple computers and Hayes modems.

Our Smartmodem 2400 and Smartmodem 1200 are also compatible with all versions of the Apple Macintosh,™ including the Macintosh Plus, Macintosh SE and Macintosh II. There's even a specially bundled package for the Macintosh that contains a Smartmodem 1200, modem cables and Smartcom II® software. Smartcom II is our award-winning software specially designed to take advantage of the power and graphics capabilities of the Macintosh.

Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.

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CIRCLE 296 ON READER SERVICE CARD

NEWSPLUS

APPLE SPINS OFF SOFTWARE

Apple has finally created an independent software company that will sell Apple and selected third-party software.

Apple Computer finally did it: It created an independent software company that will sell programs currently marketed under the Apple label. Also, the new company (as yet unnamed) will publish software it develops itself, plus programs it selects from third-party developers. Bill Campbell, formerly Apple's executive vice president of sales and marketing, will be president of the new company, which is scheduled to remain under Apple's corporate wing as a subsidiary for roughly a year before it's cut loose to survive on its own.

The news of this software enterprise shouldn't be a tremendous surprise to veteran Apple watchers. For years, the debate has raged within Apple on the wisdom of Apple's getting further into the software-publishing business. The advantage to doing so is that Apple has the resources and wherewithal to make a big splash with software. The downside is that Apple's mighty resources could scare away software developers who fear competing with Apple. Just look at the hue and cry from companies such as Software Publishing Corporation (which publishes the pfs: line), which complained that they were pushed out of the Apple II market by Apple's best-selling title, AppleWorks. Apple hopes that, by making the enterprise a separate company with a separate name, it will quell those fears. Only time will tell, of course.

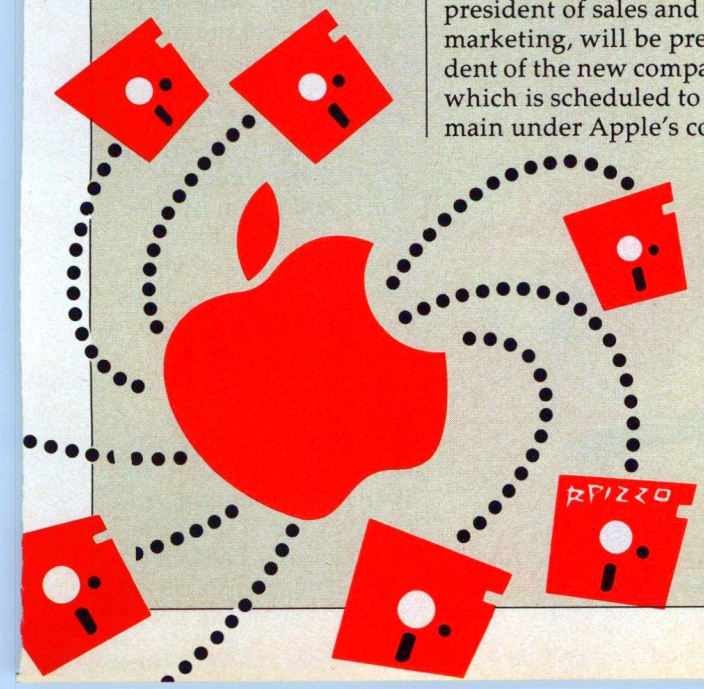
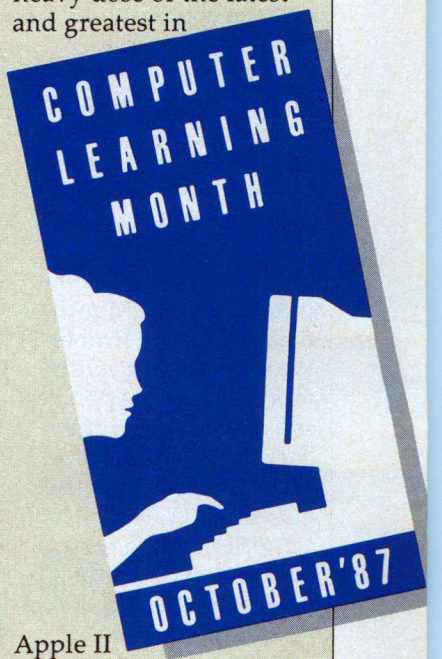


ILLUSTRATION BY ROBERT PIZZO

A FESTIVE OCCASION

Where can an Apple II aficionado go to get a heavy dose of the latest and greatest in Apple II technology? Head for San Francisco in September. That's when AppleFest '87, an all-Apple II exposition, will commandeer the San Francisco Civic Auditorium. Taking place September 18–20, AppleFest will provide hardware and software exhibits, hands-on demonstrations, sessions covering specific applications, and a showcase of educational products.



As you might expect, the keynote speakers will be Apple II inventor Steve Wozniak and Del Yocam, chief operating officer of Apple Computer, Inc. Also, by the

NEWSPLUS

Quite a bit of IIGS software should be ready to show off at AppleFest this September.

time September rolls around, quite a bit of IIGS software ought to be in its final stages and ready for its developers to show off, so AppleFest will probably be the perfect place to check out the full line of IIGS goodies.

According to show promoter Cambridge Marketing, Inc., AppleFest will also be Apple Computer's vehicle for kicking off its National Computer Learning Month activities (Computer Learning Month officially begins October 1). We expect other exhibitors also to use AppleFest as a way to highlight back-to-school promotions and launch Christmas-season sales activities. Watch for a host of *A+* events at AppleFest, including the announcement of the winners of our How I Use the II to Teach contest (see page 119 of this issue for contest rules and information).

ITTE TECHNOLOGY CONFERENCE

The Institute for the Transfer of Technology to Education (ITTE), a branch of the National School Boards Association, will be sponsoring a technology conference in Dallas, November 5–7. Besides personal computers, the conference will feature other technologies, such as television, videotape, satellites, and calculators. Conference sessions will dwell on topics such as "New Styles of District Organization," "Reshaping the Teacher's Role," and "Integrated Learning Systems." The tuition fee will be $275 for the first person from each district and $200 for each additional attendee from that district. Register before July 31 and get a 10% discount. For information, contact ITTE, 1680 Duke Street, Alexandria, VA 22314; (703) 838-6722.

CODE OF ETHICS

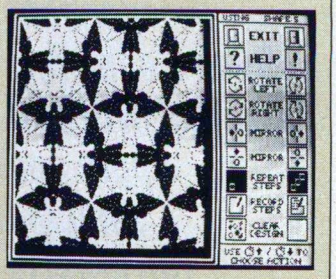
It's not always easy to know the proper thing to do when it comes to computers in schools. What sorts of concerns should teachers have about students' privacy? Who should have access to what kinds of information? What are teachers' responsibilities to their students? What is the school's responsibility to the community it serves? And then there's that old bugaboo: software copyright. What should a school's policy be on this thorny issue?

There are lots of questions, to be sure, and the International Council for Computers in Education hopes to provide some answers with two recently issued documents, *Code of Ethical Conduct for Computer-Using Educators* and the *1987 ICCE Policy Statement on Software Copyright*. Developed by special ICCE committees, the two publications are available to educators for $1 each. Write to ICCE at University of Oregon, 1787 Agate Street, Eugene, OR 97403; (503) 686-4414.

ILLUSTRATION BY ROBERT PIZZO

WIN BIG

Apple Computer Clubs International has announced a new win-a-IIGS contest. This competition is a joint effort between ACCI and Sunburst Communications, an educational-software developer. Contestants must use Sunburst's Creativity Unlimited software to create graphic designs for submission. Sunburst will provide



any school or Apple computer club with a copy of the program, which must be returned to the company or purchased at the end of 90 days. Winners will be selected "on the basis of creativity, artistic merit of the student work, and the most effective use of the product." The deadline is November 30. Grand-prize winners in two age groups will each receive complete IIGS systems, whereas six runners-up will each receive $250 worth of Sunburst software. For further information, contact ACCI at 175 Middlesex Turnpike, Bedford, MA 01730; (617)271-0400.

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NEWSPLUS

In its current form, the federal tax-reform bill may create a taxing situation for independent programmers and systems analysts.

THE NEW TAX LAW AND YOU

If the federal tax-reform bill remains in its current form, it may create a taxing situation for independent programmers and systems analysts. As it stands, certain technical consultants, such as engineers and programmers, must convince their clients to hire them as employees. Under the tax-reform bill, such professionals don't qualify for independent-contractor status for tax purposes. Seeing this situation as inequitable, U.S. Senator Alfonse D'Amato (R-NY) has proposed a bill (SB 491) to repeal the section of the tax code that stipulates these new rules about technical consultants. At this writing, a Senate subcommittee was reviewing the bill, and, from there, it was scheduled to wend its way through the legislative voting process. If you're interested in having your voice heard about this bill or getting more information on it, Senator D'Amato encourages you to contact your U.S. senator.

GIMME ONE GOOD REASON

Why would a child want to join an Apple computer club? A recent issue of Apple Computer Club International's monthly newsletter gives a telling glimpse. The newsletter quotes excerpts from letters written by children who wanted to join an Apple club in Los Angeles. Some of the explanations emphasized practicality:

- "I want to learn about computers because I want to be an astraunant [sic] and I have to know computers."
- "If I learn about computers my mom will buy me a computer."

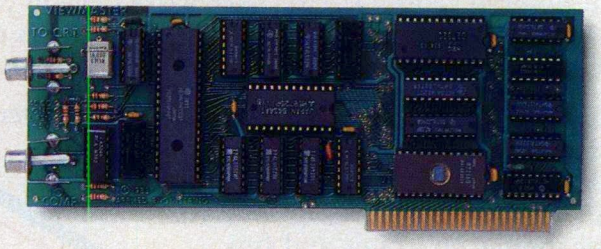
Others focused on the social rewards of computer-club life:

- "If I get in the club I'll be very good because I'm always good. Ask anyone."
- "I need to be in the Apple Club because I want a good life and a good wife."
- "If you let me in the club I'll be your best friend."

ILLUSTRATION BY ROBERT PIZZO

Viewmaster 80

Now run AppleWorks™ on your II+ *and* keep full 80 column compatibility!



	BUILT-IN SOFTSWITCH	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN HOME	7 x 9 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERRIDE	INVERSE CHARACTERS	
VIEWMASTER 80	✓	✓	✓	✓	✓	✓	✓	✓	
SUPRTERM		✓					✓	✓	
WIZARD 80					✓		✓	✓	
VISION 80	✓	✓			✓				
OMNIVISION		✓					✓	✓	
VIEWMAX 80	✓	✓			✓			✓	
SMARTERM	✓	✓				✓	✓		
VIDEOTERM		✓	✓		✓	✓		✓	

One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

Each Viewmaster 80 includes our powerful AppleWorks expand software, allowing AppleWorks to run on the II+ with only 64K (or more) memory. (We recommend the RamFactor memory card, but any compatible Apple memory card will work.) The software provides our full range of AppleWorks enhancements, including expanded records, word processor, multi-disk saving, time and date display on screen with any PRO-DOS clock, and more!

The Viewmaster 80 works with all 80 column applications, including DOS 3.3, PRO-DOS, CP/M, Pascal, WordStar, Format II, Applewriter II, dBase II, Visicalc, Multiplan, and *hundreds* of others—including AppleWorks.

Here are just a few of the powerful features the Viewmaster 80 delivers for a great price ($149):
• 80 Characters by 24 lines • Fully compatible with all Apple languages and software • Highest compatibility with existing 80 column software • Very low power consumption • High speed (18 MHZ) scroll rate • Upper and lower case characters and true descenders, both inverse and normal; all on-screen editing functions are supported • User-definable cursor shape • Compatible with Apple II, II+ and IIe • Five-year warranty

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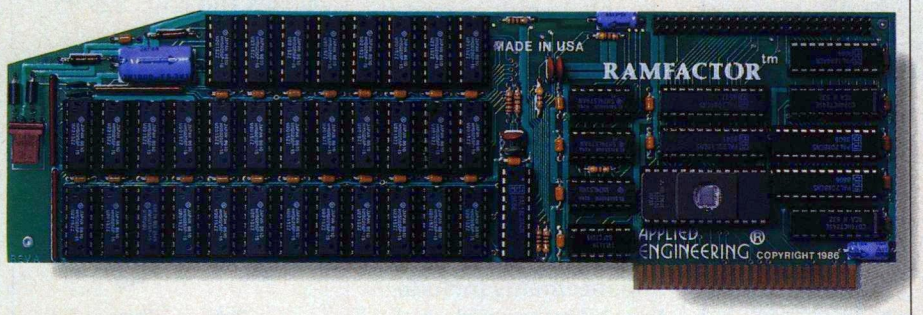
RamFactor™

Boot any II+, IIe, or IIGS and be up and running your favorite software in less than 1 second.

Now anyone with an Apple II+, Franklin, Laser 128, Apple IIe or IIGS preferring to use slots 1 through 7 can now enjoy the speed and performance that they've been waiting for.

With RamFactor, you'll be able to instantly add another 256K, 512K, or a full 1 MEG on the main board and an expansion connector can address an additional 16 MEG of memory for possible future expansion. Since virtually all software is automatically compatible with RamFactor, you'll immediately be able to load programs into RamFactor for instantaneous access to information. You'll also be able to store more data for larger word processing documents, bigger data bases, and expanded spreadsheets. And with the battery back-up option, you can switch on your Apple and your favorite software will be up and running in less than 1 second!



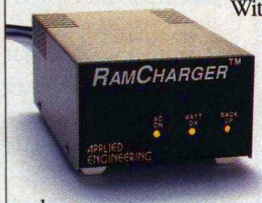
Very Compatible

All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

AppleWorks Power

There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of records in the database and lines permitted in the word processor, and RamFactor is the only standard slot card that will automatically load all of AppleWorks into RAM dramatically increasing speed and eliminating the time required to access the program disk, it will even display the time and date on the AppleWorks screen with any ProDos clock. RamFactor will automatically segment large files so they can be saved on 5¼", 3½", and hard disks. All this performance is available on the Apple II+, IIe, Franklin, or Laser 128 when used with an 80 column display. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

The "Instant On" Apple.



With the RamCharger battery backup option, RamFactor will retain programs and data during power failures or even when you turn your computer off. And because RamFactor plugs into slots 1-7, it's the only memory card that can cold boot an Apple without using slow floppy or hard disks. An available "Y" cable allows one RamCharger to power two RamFactors.

Powerful Program Switcher

With RamFactor, you can organize memory into multiple work areas and switch between them. Each work area can contain different programs and even different operating systems. Now you can switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/M to Pascal to ProDos in under a second. And with our battery back-up option, you can have permanent storage for up to 20 years.

Features:

- 256K to 1 MEG on main board. Expansion connector for possible further expansion to 16 MEG.
- Fully Apple II Memory Expansion compatible
- Compatible with Apple IIe, II+, IIGS, Franklin and Laser 128
- Battery back-up option allows you to turn on your Apple and run your favorite programs in less than 1 second!
- Automatically recognized by ProDos, DOS 3.3, Pascal, and standard CP/M
- Built-in RamDrive™ software (a true RAM disk not disk caching)
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- Automatic expansion with AppleWorks 1.3 or 2.0
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(Allows one RamCharger to power two RamFactors.)

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CIRCLE 202 ON READER SERVICE CARD

NEWSPLUS UPDATE

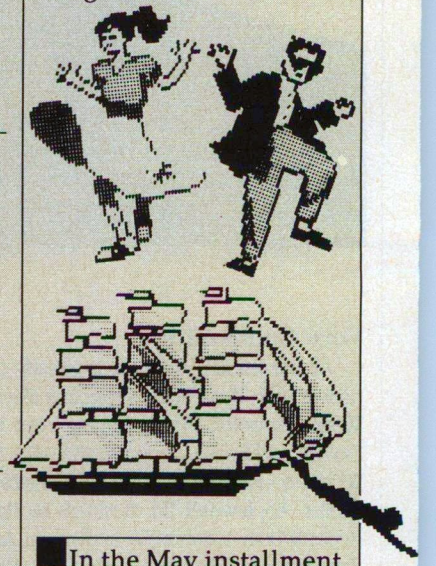
Orange Micro has dropped the price on its RamPak 4GS memory card for the IIGS from $259 to $225 for a card with 512K of memory. Additionally, the company has reduced the price of 256K RAM-expansion kits, from $99 to $49. Orange Micro says it's able to reduce prices so quickly because volume is high and chip prices have come down.

Apple Computer, Inc., recently released version 1.5 of its Instant Pascal programming language. Enhancements include the ability to work with non-Apple printers and 3.5-inch drives as well as hard disks and certain RAM cards.

Intuit has followed a similar path and developed a ProDOS version for its checkbook program, Quicken, that works with 3.5-inch drives, hard-disk drives, and many of the more popular memory boards. The new version can also merge data from multiple accounts into AppleWorks spreadsheets.

WordPerfect Corporation, maker of the popular WordPerfect word-processing program, is now shipping WordPerfect in a package that includes both 3.5- and 5¼-inch diskettes for the Apple IIe and IIc. The 3.5-inch version fits on a single diskette, and the 5¼-inch version comes on three diskettes.

Watch for a clip-art disk from Activision for Paintworks Plus, Activision's IIGS painting program. The Clip Art Gallery includes 600 images and costs $29.95.



In the May installment of "NewsPlus" (page 15), we got our Apple ROM and Apple Language Cards mixed up. A reader astutely pointed out that a photo accompaning an article about Applied Engineering's new Pocket Rocket card for the II Plus showed the Pocket Rocket next to an Apple ROM card, rather than an Apple Language Card.

Also in the May issue, we published an incorrect number for CompuHelp, an on-line bulletin board for the visually impaired. The correct number is (916)786-3923. +

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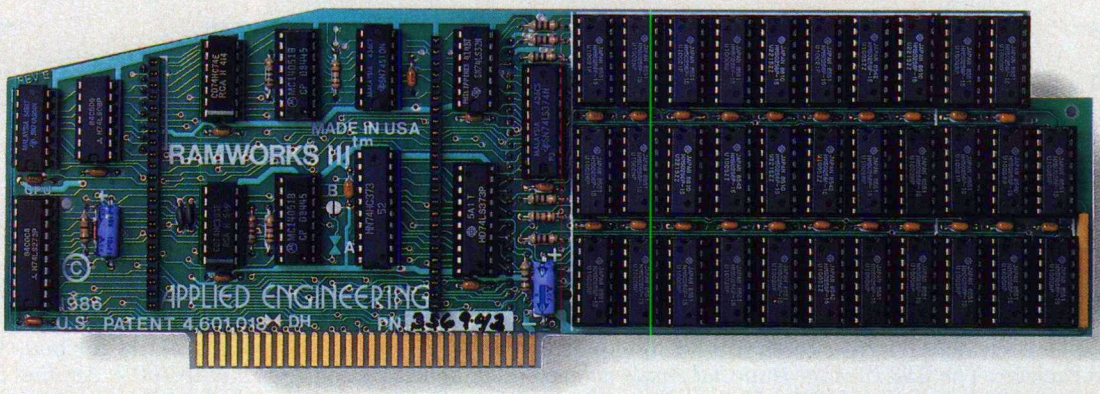


With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, Pro-Filer, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601018) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

It Even Corrects Mistakes.

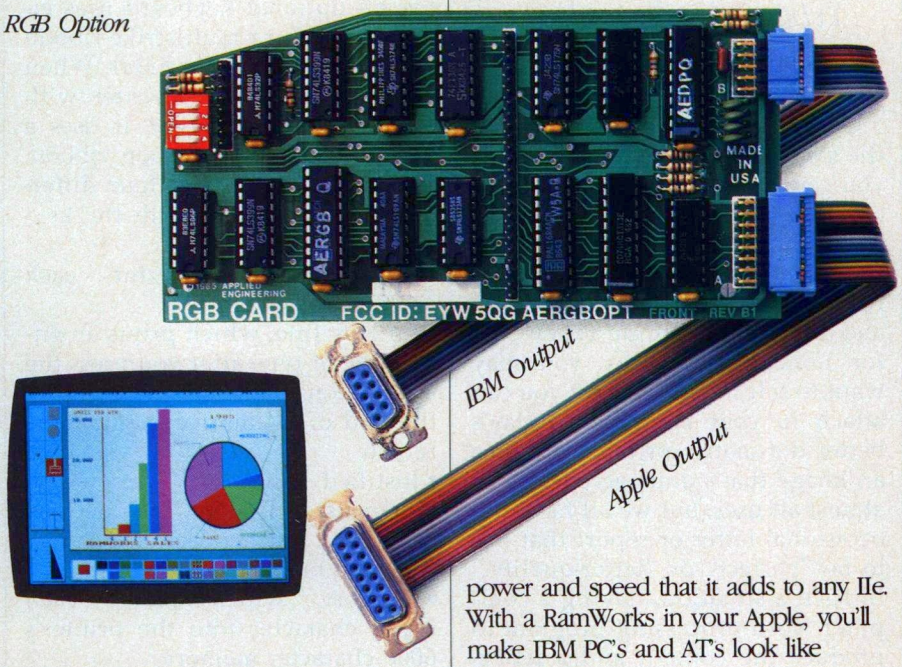
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option



True 65C816 16 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."

"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

It's Got It All

- 15 day money back guarantee
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- Built-in super sharp 80 column display, (U.S. Patent #4601018)
- Expandable to 1 MEG on main card
- Expandable to 16 meg with expander cards, with NO slot 1 interference
- Can use 64K or 256K RAMs
- Powerful linear addressing 16 bit coprocessor port
- Automatic AppleWorks expansion up to 3017K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
- RamDrive™ the ultimate disk emulation software included free
- Memory is easily partitioned allowing many programs in memory at once
- Compatible, RGB option featuring ultra high resolution color graphics and multiple text colors, with cables for both Apple and IBM type monitors
- Built-in self diagnostics software
- Lowest power consumption (U.S. Patent #4601018)
- Takes only one slot (auxiliary) even when fully expanded
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- Displays date and time on the AppleWorks screen with any PRO-DOS compatible clock
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COVER STORY *BY MICHAEL FISCHER*

The Typewri CONNECT

Team your Apple II up with an electronic typewriter for letter-quality printing

Try to address just one envelope with your Apple II and printer. By the time you get the software loaded, the text typed and centered, the printer turned on, and the envelope aligned, you can address a score of envelopes with a typewriter. Seemingly simple tasks such as this one can help you recall exactly how useful a typewriter can be.

In fact, typewriters have the edge in terms of convenience when it comes to limited printing jobs—a couple of envelopes, a brief note, a half dozen mailing labels, or an insurance form, to name a few applications. Just sit down and type. No waiting for the system to warm up while hunting for disks. No New File commands, no page formatting, no guessing whether or not the mailing labels will print half an inch too far to the left.

Computers and printers, of course, outshine even the fanciest electronic typewriters when producing longer documents or creating a mass mailing with an individual salutation on each one. They also have the important advantage of allowing you easily to edit your writing.

What if you could have the best of both worlds? In fact, you can choose from several ways to obtain typewriter convenience plus the power of an Apple II.

Here's one option: Because typewriters are becoming more sophisticated, you might be able to get both a printer and a typewriter in the same machine. In other words, you can buy a typewriter that can also print out text that it receives from your computer.

Alternatively, even if you already have a dot-matrix printer and buy an electronic typewriter for noncomputer uses, you may want to select a model that you can attach to your computer. Today's better dot-matrix printers produce an image that's quite acceptable in almost all uses, but we all have the occasional letter or report that has to be "perfect" or "letter-quality." In such a situation, having a computer word-processing program to produce the content and a letter-quality electronic typewriter to produce the output is the right combination. For other uses, the speed of a dot-matrix printer is preferable to the more perfect letters a typewriter produces.

A third option is to purchase a printer with a special keyboard attached. This approach lets you sit down at the printer as if it were a typewriter. The only company that makes such a machine is Brother, which produces both the Brother and Dynax lines of printers. The keys on these printers' optional add-on keyboards are somewhat slower and softer in response than the keys on a typical typewriter or computer. The Brother printer that has an optional keyboard uses either a carbon or multistrike ribbon when working as a printer. When functioning as a typewriter with the keyboard, however, it uses a correctable, lift-off carbon ribbon. You can select among four different operating states with the keyboard:

- Character, which prints each character as you type it
- Line by line, which prints an entire line of type after you press the Return key or when you come to the end of a line using automatic return
- Justified line by line, which works just as line by line does, except that it justifies each line so that the right margins are even
- Memory, which places each typed character into the printer's 6000-character memory

The Brother keyboard/printer combination gives you a number of advanced electronic-typewriter features, including decimal tabulation, centering, superscript, subscript, and a one-line correction memory.

The Connection

Using a typewriter as an output device can involve some careful decision making. You have to consider many variables, such as internal or external interface connections, parallel or serial cables, and control codes.

Some electronic typewriters

ter ION

come with a computer interface as part of their standard configuration. All you need to do to connect this kind of typewriter to your computer and employ it as a printer is to attach a cable between the interface connector on the typewriter and the interface connector on your computer.

Among the companies that manufacture such typewriters are Brother/Dynax, Canon, Sharp, Silver Reed, and Smith Corona. Royal is another participant in this market but will discontinue its line by the end of the year.

Other electronic typewriters do not come with an interface card as a standard item but have an optional add-on interface that may be either internal or external. Such typewriters are made by IBM, Olivetti, Olympia, Royal, and Silver Reed.

An internal interface card is usually installed by your typewriter dealer or the factory. Sometimes, though, you can install it yourself. The unit typically consists of a printed circuit card that is inserted into the typewriter and resembles the printer interface you place in a slot in an Apple IIe or IIGS.

An external interface resides outside the typewriter. It consists of a closed box with several connectors on it and a cable that attaches to a connector on the typewriter. The disadvantage of this approach is that it places an extra, space-consuming, box on your desk, but it does have several advantages over an internal interface:

- Since you can install the external interface yourself, you can buy the typewriter and don't need to bring it back later if you decide you want the interface.
- The external interface often has both a serial and parallel connection, whereas the internal interface is almost invariably parallel.
- Some of the external interfaces have features such as a buffer that holds text waiting to be printed or buttons that mimic the line-feed, form-feed, and on-line buttons of a standard computer printer.

Hooking It Up

If you've already used a printer with your computer, you know that connecting a printing device to your Apple is not always simple. Part of the complexity depends on what type of Apple you have (see "Parallel or Serial?" on page 34).

If you have an Apple II Plus or IIe you will need an interface card to go inside your computer—whether you're hooking your Apple to a printer or a typewriter. Computer printer interfaces are either parallel or serial. For convenience, the interface you select should match the type of connector on the electronic typewriter (normally a parallel interface). Although the IIGS has a built-in serial interface, you can also install a parallel printer interface in it if that's what the typewriter requires.

If you have an Apple IIc or IIGS or want to use a serial interface card in an Apple II Plus or IIe, you still have a couple of options. You can select an electronic typewriter that uses a serial connection (usually an external interface to the electronic typewriter). You can also buy a parallel-to-serial converter box that takes the parallel signal the typewriter requires and converts it to a serial signal from your Apple.

Once you have connected the typewriter to the computer, you have the additional task of making the typewriter print what you want it to. If you are just printing standard text, you can normally use any word-processing program—but if you want the electronic typewriter to use special features such as underline and boldface, you need to know the special characters, or control codes, to send to the typewriter. The typewriter does not print the control codes but, rather, turns on or off certain features when it receives the codes. Printers also require control codes for special features.

Control-Code Standards

Many printers, particularly daisy-wheel printers, follow similar sets of control codes. Those

codes originally designed for the Diablo series of daisy-wheel printers are the most common, followed closely by those originally for Qume printers. Many other manufacturers of daisy-wheel printers have designed their printers so that they respond to these codes. Some word-processing programs, among them AppleWorks', come with the control codes for some of the more common printers (both daisy-wheel and dot-matrix) built into the program.

Electronic typewriters, though, have several problems when it comes to control codes:

- Control codes vary from typewriter to typewriter. Most companies have a proprietary system. One notable exception is Silver Reed, which generally follows Diablo codes with its typewriters.
- The special setup menus of word-processing and other printing programs do not include electronic typewriters. You have to know the control codes for the typewriter and then can use only the codes in those programs that allow for their special entry—such as AppleWorks. (See the sidebar on page 36 of this article to see whether your favorite word processor lets you do this.)
- The users' manual of the typewriter does not normally contain information about control codes; thus, you should insist that your dealer supply that information.

Picking an Electronic Typewriter

What should you look for as you select an electronic typewriter that can work with your Apple? Of course, you should consider the various typewriter features of the machine. For further information, you should consult a consumer-guide publication such as *Consumer Reports*.

When you look at electronic typewriters, you'll find a broad range of costs, sizes, and features. To a great extent, though, price depends on durability and features.

The more expensive electronic typewriters typically contain a larger printer motor and are made with steel lining on the inside. If you're going to be using the typewriter a lot, you should consider paying more for a more durable unit. Treating a typewriter as a computer printer places more stress on its components than does merely typing on it.

The more expensive electronic typewriters generally also have wide carriages, permitting you to use paper up to 17 inches wide in some cases. You'll get most of the utility of the wide carriage when you're using the typewriter as a typewriter—using special forms, for instance. You may also have an occasional wide-paper use with the computer, but remember that many word-processing programs assume a page width of 8½ inches, and even those that permit you to specify a wider setting don't conveniently display the extra width on the screen.

You should also consider speed. An electronic typewriter is a daisy-wheel printer by heritage and build. Typical speeds run from 10 to 18 characters per second. An electronic typewriter is generally a bit slower than a comparably priced daisy-wheel printer.

Ribbons and Print Wheels

Depending on the make and model of electronic typewriter, you might have some problem getting supplies for that machine. In the daisy-wheel-printer market, by contrast, several "standards" are available for ribbons and print wheels. For example, many printers other than the Diablo Hytype printer use the ribbons and print wheels made for that printer. The same is true of Qume ribbons and print wheels.

With electronic typewriters, though, you'll find less standardization. The Olivetti print wheel and ribbon are used by nearly every Olivetti typewriter and by some Olympia and Royal typewriters, but that's about the extent of any standard. Most companies, such as Silver Reed, have the same ribbon and print wheel that nearly all the typewriters from that company—and that company only—use. Other companies—notably Panasonic and Sharp—use several different ribbon and print-wheel types among the typewriters they make.

You will also find limitations on the type of ribbons available. Most electronic-typewriter ribbons are single-impression carbon ribbons. Whenever you type a letter, the printer advances by the width of one letter. In the printer market, by

TYPES OF TYPE

The output options for owners of Apple II-series computers are many. There are typewriters, and then there are printers—dot-matrix, daisy-wheel (letter-quality), and laser. The more expensive the output device, the more likely it is that you'll get higher-quality printing with greater all-around convenience. Below is a type sample from each category of device. You'll notice that daisy-wheel printing and typewriter text look practically identical. That's because they use the same mechanical means—a daisy-wheel print head—to create characters.

Dot-Matrix (ImageWriter)

Type from a Dot-Matrix printer (Imagewriter)

Strengths: High-speed printing. Good graphics capabilities.
Weaknesses: Print quality not high enough for many professional purposes.
Price range: Less than $200–$1000.
Trade-offs: Higher price gets you better-quality printing.

Electronic Typewriter

Type from an electronic typewriter

Strengths: Very convenient for high-quality, low-volume output.
Weaknesses: Slow. Not effective for high-volume printing. No graphics capabilities.
Price range: $200–$900.
Trade-offs: Higher price gets you greater speed and durability.

Daisy-Wheel

Type from a daisy-wheel printer

Strengths: High-quality printing.
Weaknesses: Slow. Can't handle graphics. Price range: $200–$1500.
Trade-offs: Higher-priced models are faster.

Laser (LaserWriter)

Type from a LaserWriter

Strengths: Very-high-quality output for both text and graphics.
Weaknesses: To date, no system software for Apple II that lets it take advantage of the LaserWriter's PostScript language.
Price range: $6000
Trade-offs: The high price gets you excellent print quality. *Lisa Raleigh*

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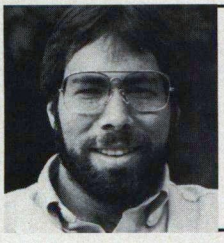

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Steve Wozniak, the creator of Apple Computer

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Typewriters for IIs

PRODUCT	PRICE	CARRIAGE WIDTH	SPEED	DICTIONARY	MEMORY	PARALLEL INTERFACE
BROTHER CX-80	$599.95	14.5"	15 cps	60,000 words	5K	optional
BROTHER CX-90	$549.95	14.5"	15 cps	70,000 words, optional	7K	optional
EPSON ELITE 350 PLUS	$599.99	14"	14 cps	75,000 words	up to 32K, optional	built-in
EPSON EXPERT 2500	$799.99	14"	14 cps	75,000 words	up to 64K, optional	built-in
IBM QUIETWRITER 8	$1125	16.5"	31 cps	optional	31K	optional
OLIVETTI CX440	$359	13.2"	13 cps	80,000 words, optional	1.2K	optional
OLIVETTI CX880	$499	15"	15 cps	none	none	built-in
OLIVETTI ET109	$625	15.5"	20 cps	none	none	optional
OLIVETTI ET112	$730	17"	20 cps	optional	none	optional
OLIVETTI ET116	$895	17"	20 cps	optional	6–22K	optional
OLYMPIA CARRERA	$249	13"	12 cps	none	none	optional
OLYMPIA COMPACT S	$549	15"	14 cps	none	none	built-in
OLYMPIA ES95	$549	15"	15 cps	none	none	optional
OLYMPIA MASTERTYPE	$649	15"	15 cps	none	none	built-in
OLYMPIA MASTERTYPE D	$699	15"	15 cps	none	none	built-in
OLYMPIA PROFESSIONAL 220	$999	17"	25 cps	optional	4–12K	optional
OLYMPIA STANDARD 200	$699	17"	25 cps	none	none	optional
OLYMPIA STANDARD 210	$749	17"	25 cps	none	none	optional
OLYMPIA STARTYPE	$849	15"	15 cps	optional	12K	built-in
OLYMPIA SUPERTYPE 230	$1299	17"	25 cps	optional	20–28K	optional
OLYMPIA SUPERTYPE 240	$1549	17"	25 cps	optional	20–28K	optional
PANASONIC KX-W50TH	$219.95	10"	22.5 cps	none	none	none
PANASONIC KX-W60TH	$259.95	10"	22.5 cps	none	6–14K	none
PANASONIC RK-H500	$249.95	12"	24 cps	none	2K	none
PANASONIC RK-P240	$269.95	8.5"	6.5 cps	none	1K	none
PANASONIC RK-P440	$339.95	8.5"	6.5 cps	none	6.5K	none
PANASONIC RK-T30	$259.95	12"	11 cps	none	7K	none
PANASONIC RK-T32	$329.95	15"	11 cps	73,000 words	12K	none
PANASONIC RK-T34	$369.95	12"	11 cps	63,000 words	12K	none
PANASONIC RK-T37	$479.95	12"	unknown	63,000 words	8K	none
PANASONIC RK-T40D	$419.95	12"	12 cps	none	8K	none
PANASONIC RK-T55	$599.95	14"	12 cps	86,000 words	8K	built-in
SILVER REED 85EP	$199	12"	10 cps	none	none	optional
SILVER REED 89SP	$349	12"	10 cps	90,000 words	0–4K	built-in
SILVER REED EX60	$995	17"	20 cps	none	8–16K	optional
SILVER REED EX78	$1445	17"	30 cps	none	19K minimum	
SILVER REED EZ30	$395	13"	12 cps	90,000 words, optional	0–8K, optional	optional
SILVER REED EZ50	$795	17"	20 cps	90,000 words, optional	64K, optional	optional
SMITH CORONA XD 8500	$619	13"	15 cps	75,000 words	16K	optional
SMITH CORONA XD 6600	$459	13"	11.5 cps	60,000 words	12K	optional
SMITH CORONA XD 6700	$539	13"	11.5 cps	75,000 words	16K	optional
SMITH CORONA XE 6200	$379	13"	11.5 cps	50,000 words	8K	optional

This chart contains a sampling of products, and the information herein is based on manufacturers' claims.

There are many points to consider when you select a typewriter to use with your Apple II. You should determine not only how the typewriter will connect with your Apple but also what typewriter features suit your needs. Below are specifications for many popular typewriters that can work with your Apple II. Canon and Sharp also produce products that fit this category, but neither company was able to send us any information. Royal has typewriters of this kind but will be discontinuing them by the end of the year.

SERIAL INTERFACE	DISPLAY	KINDS OF TABS	AUTOMATIC PAPER INS.	SPROCKET FEED	SHEET FEEDER	NOTES
optional	none	A	yes	none	none	10, 12, 15 pitch
optional	none	A	yes	none	none	10, 12, 15 pitch
none	34 chars.	A	none	none	none	thesaurus
none	40 chars. × 4 lines	A	none	none	none	optional modem; thesaurus
none	24 chars., optional	A	yes	none	none	optional application cartridges with forms
none	none	A	none	none	none	
optional (with 2K buffer)	none	A	yes	none	none	
none	none	A	none	none	none	
optional	none	A	yes	none	none	
optional	24 chars.	A	yes	optional	optional	reverse print
none	none	A	yes	none	none	
optional	none	A	yes	none	none	
optional	none	B	yes	optional	optional	
optional	none	B	yes	optional	optional	
optional	20 chars.	B	yes	optional	optional	
optional	20 chars.	B	yes	optional	optional	optional disk drive
optional	none	B	yes	optional	optional	
optional	20 chars.	B	yes	optional	optional	
optional	40 chars.	B	yes	optional	optional	optional disk drive
optional	40 chars.	B	yes	optional	optional	optional disk drive
optional	40 chars.	B	yes	optional	optional	built-in disk drive
optional	15 chars.	C	none	none	none	battery or AC; thermal transfer
optional	20 chars.	C	none	none	none	battery or AC; thermal transfer
optional	15 chars.	A	none	none	none	thermal transfer process
optional	15 chars.	A	none	none	none	4-color graphics
optional	24 chars.	A	none	none	none	4-color graphics
optional	15 chars.	A	none	none	none	
optional	15 chars.	A	none	none	none	
optional	32 chars.	A	none	none	none	
optional	28 chars. × 2 lines	A	none	none	none	
optional	32 chars.	A	none	none	none	
none	32 chars.	A	none	none	none	
optional converter	none	C	none	none	none	10, 12, 15 pitch
optional converter	19 chars.	A	none	none	none	10, 12, 15 pitch
optional	20 chars.	A	yes, and programmable	optional	optional	10, 12, 15, proportional
optional	32 chars. × 2 lines	A	yes, and programmable	optional	optional	
none	20 chars. optional	A	none	none	none	10, 12, 15 pitch
none	40 chars. optional	A	yes	none	optional	alternate keyboards: Dvorak and multilingual
optional	40 chars.	D	yes	none	none	4 pitches
optional	16 chars.	D	yes	none	none	3 pitches
optional	40 chars.	D	yes	none	none	3 pitches
optional	none	A	yes	none	none	2 pitches

A: Normal (left-justified) and decimal tabs **B:** Normal, decimal, and centering tabs **C:** Normal only **D:** Normal, decimal, centering, and right-justified tabs

PARALLEL OR SERIAL?

Lisa Raleigh, Chip Carman, and Michael Fischer

Chances are the typewriter you select to use with your Apple II computer will have a parallel interface. That's good news.

The major advantage of the parallel interface is that it comes with a standard connector—meaning that you can get a parallel-interface card, insert it into your Apple II Plus, IIe, or IIGS, and connect it to your typewriter with a standard, off-the-shelf, parallel cable.

In contrast, the alternate interface approach—called serial—can be more convoluted. The world of serial interfaces isn't nearly as standard, and a serial cable you have on hand to connect your Apple to, say, an ImageWriter, may not be the right one to connect it to a typewriter. The problem is that, even though the cable connector might have the right number of pins (usually 25), the wires inside the cable leading to those pins can be arranged in a variety of ways. Thus, even though you can physically connect two serial ports, the proper signal might not get through.

Generally, you want to use a serial cable that you've seen in action in a store, connecting an Apple II to a typewriter. If it's a standard IIc-to-ImageWriter I or a IIGS-to-ImageWriter I cable and that's what you already have at home, use that. (Note: Cables meant to connect to the newer ImageWriter II probably won't work, because that printer has a new style of connector, called a mini-circular 8.) Otherwise, buy whatever the dealer's using. Another option is to make a custom cable with the proper wiring, or buy a Universal Smart Cable. The Smart Cable, made by IQ Technologies, Inc., 11811 NE First Street, Bellevue, WA 98005; (206) 451-0232 (distributed by IAM, P.O. Box 2545, Fair Oaks, CA 95628 [916] 961-8082), automatically configures the wiring so each pin gets the right signal.

Now that we've sufficiently warned you about serial shortcomings, you should know that in some instances, you may be compelled to choose a typewriter with a serial connector:

- The Apple IIc comes with a serial connector on the back but not a parallel one. Also, the IIc doesn't allow you to add plug-in boards that would let you install a parallel connection. (These limitations, of course, increase the likelihood that you'll buy Apple's own serial printer, the ImageWriter.) The only option you have for making a parallel connection is to buy a serial-to-parallel converter box that will let your IIc communicate with a parallel typewriter.
- The IIGS comes with a standard serial port but also allows you to add plug-in cards, so you can easily add a parallel card if you so desire. A parallel connection may present a problem, however, when Apple gets around to releasing its Finder for the IIGS later this year. The Finder, like the Macintosh's Finder, will control how you are able to use the desktop, files, folders, and peripherals on the system. With the Finder, you'll select your printer from a "desk accessory" pull-down menu. But, at this time, Apple plans to include only its own serial printers—only the ImageWriter and LaserWriter—as selections on this menu. So Apple itself may not provide a way to "recognize" (i.e., use) a parallel device for those who are using a IIGS with the Finder installed. Third-party parallel-card and parallel-printer manufacturers will probably supply the special software you need to make the Finder recognize parallel connections, though. As with the IIc, you can use a serial-to-parallel converter box if you want to use the serial port with a parallel typewriter, but no one knows whether or not this kind of setup will work later on when the Finder enters the picture.

comparison, you can also find multistrike ribbons in which the ribbon advances only every third or fourth letter.

A single-impression carbon ribbon produces the finest image—at the expense of a shorter ribbon life. If you are printing out many drafts of letters, you certainly don't want to pay for that degree of quality. The ordinary output of a single-impression carbon ribbon is about 40 double-spaced pages, although the Olympia and Olivetti ribbons can produce about twice that amount because they are longer.

Electronic typewriters also vary in availability of certain print characters on the print wheel. Most printer and typewriter daisy wheels have a print wheel with 96 characters. Computer keyboards generally have the symbols {, [,], }, |, \, and ~. Some electric typewriters also have these characters. Others have foreign-language characters (e.g., Spanish Ñ and ñ and French Ç and ç), fractions (such as ½ and ¼), and/or various other symbols (such as ¶ or §).

Typewriters vary among the available symbols, depending on the print wheel you use, meaning that they don't always print the symbol that is appearing on your screen. For example, the typewriter might convert the computer character } into ¶.

Tractor Feeds

Most printers, whether dot-matrix or letter-quality, either come with a tractor feed or have one available as an option. By contrast, none of the electronic typewriters have a tractor feed. If you are printing a one- or two-page document, you can hand-feed the individual sheets, but that is frustrating and time-consuming on a multipage document, particularly given the relatively slow speed of the electronic typewriters.

Don't attempt to get around this problem by using continuous-feed paper and the friction-feed mechanism of the electronic typewriter. A friction-feed mechanism does not maintain absolute alignment of the page as it pushes the paper through the typewriter. When working with one or two sheets, you won't notice the lack of alignment, but when you are printing a larger document on continuous-feed paper, each misalignment

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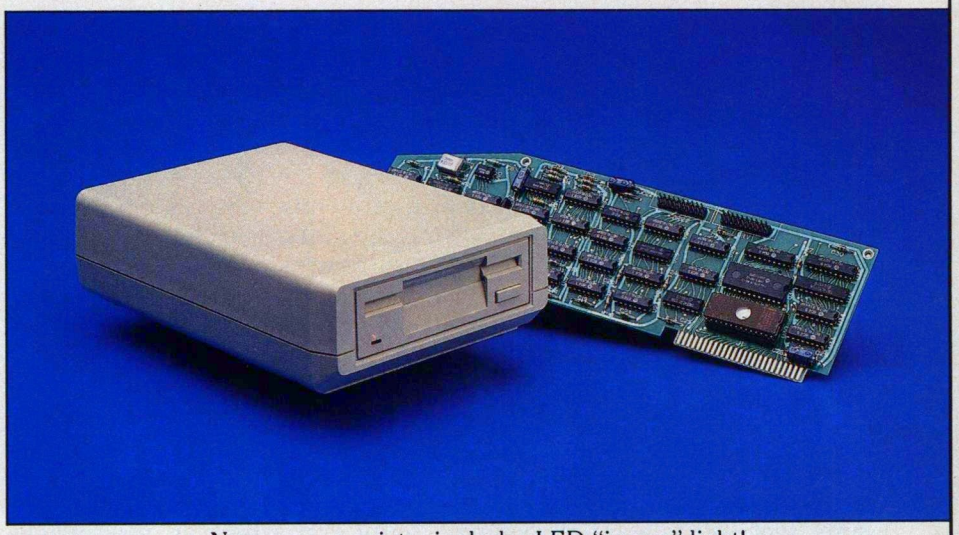

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CIRCLE 111 ON READER SERVICE CARD

HOW WORD-PROCESSING PROGRAMS HANDLE CONTROL CODES

To get your electronic typewriter to do tricks such as underlining and boldface, you must know which control characters to send it from your Apple II.

To obtain those control codes, check with the typewriter dealer. In fact, if you plan to create anything fancier than plain text, you'll want to be sure that the typewriter you're purchasing is one for which the control codes are readily available. Some manufacturers make this information extremely difficult to obtain, so do yourself a favor—don't belatedly discover that you must go through contortions to obtain this vital information.

Obtaining a list of the control characters, though, is only part of the process. You also have to make sure that your word-processing program will let you add these codes to your document (see table below). Otherwise, you'll be limited to plain-vanilla text. If your software does allow such a capability, you have to make a further distinction: Some programs (such as AppleWorks) let you add control characters via setups or configuration menus, whereas others (such as Apple Writer) allow you to type the control codes into the document itself. And some programs allow you to do it either way. When you send documents to the typewriter, the control codes themselves are not printed, but are intercepted by the typewriter. The typewriter then "knows" when to begin and end boldface, or superscript, or whatever else you've specified.

Lisa Raleigh, Chip Carman, and Michael Fischer

Allow Embedding of Codes in Text
Apple Writer II
CircaScript Plus
Executive Footnoter
Executive Secretary
Homeword Plus V. 1
Homeword Plus V. 2
Magic Window IIe
MasterType's Writer
PFS:Write
SpeedScript
The Write Choice
Word Juggler
WordPerfect 1.1
WordPerfect GS
Write Away
Writer's Choice

Use Setup Menus or Drivers
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Gutenberg Jr.
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MECC Writer**
Milliken Word Processor**
MultiScribe GS
MultiScribe V. 2.0

Notes: * The company will make a custom printer driver if you send it the control codes for your printer. ** You can send commands to set up a particular feature, but the feature will be active throughout the print session; i.e., you can produce, say, boldface type but not for a single word or line.

passes on to the next sheet, eventually resulting in pages with noticeably slanted print.

A solution to the tractor-feed problem is the Turn 10 Universal Forms Feeder/Stacker. Although this device looks intimidating, it is actually quite easy to set up and use. It has two sets of connected tractor pins, one to help align the paper as it enters the typewriter and the other to retain the alignment as the paper is pulled through the typewriter. The feeder/stacker works with paper up to nearly 15 inches wide and requires neither electric power nor a mechanical connection to the typewriter. An added bonus is that the paper that goes through this unit is neatly stacked.

In some cases, the electronic typewriter may be capable of performing feats when connected to your printer that it cannot handle when you use it with its keyboard. An electronic typewriter often uses the same internal machinery as that of a daisy-wheel printer. When converting the printer to a typewriter, manufacturers may choose, for either pricing or market-positioning reasons, not to permit the use of some features, so they prevent the keyboard from generating the appropriate control code. The typewriter will still respond to the control code if it comes from your computer.

What's the Best Choice?

The chart on pages 32-33 shows some of the typewriters available for use with your Apple. For each typewriter, we have indicated its price, whether the interface is internal or external, and whether it accepts parallel or serial connectors. The prices are manufacturers' suggested retail prices and, in the case of typewriters with an optional interface, include the price of the interface.

Not everyone needs an electronic typewriter that can be connected to a computer, just as not everyone needs either a letter-quality printer or a dot-matrix printer capable of producing graphics. But if you decide you need both a typewriter and a computer printer and don't want to spend the money or set aside the space for both, you should consider the possibility of an electronic typewriter that can lead a double life. +

Michael Fischer works in the field of court administration in California and writes about Apple computers. His latest book is Apple IIGS Technical Reference, *from Osborne/McGraw-Hill. Keith Carter and Roger Sordelet of OEM, Inc., a San Francisco-area specialist in the computer-typewriter connection, served as a valuable research resource for this article.*

TYPEWRITER MANUFACTURERS

Brother International Corporation
8 Corporate Place
Piscataway, NJ 08054
(800) 284-4357
CIRCLE 380 ON READER SERVICE CARD

Epson America, Inc.
2780 Lomita Blvd.
Torrance, CA 90505
(800) 421-5426
CIRCLE 381 ON READER SERVICE CARD

International Business Machines Corporation
National Distribution Division
101 Paragon Drive
Montvale, NJ 07645
Inquire at your local IBM office.
CIRCLE 382 ON READER SERVICE CARD

Olivetti USA
Office Products Division
Consumer Products
765 U.S. Highway 202
Somerville, NJ 08876-1289
(201) 526-8200
CIRCLE 383 ON READER SERVICE CARD

Olympia USA, Inc.
Box 22
Somerville, NJ 08876-0022
(201) 722-7000
CIRCLE 384 ON READER SERVICE CARD

Panasonic
One Panasonic Way
Secaucus, NJ 07094
(201) 348-7000
CIRCLE 385 ON READER SERVICE CARD

Silver Reed America, Inc.
19600 South Vermont Avenue
Torrance, CA 90502
Written inquiries only (Customer Service Department)
CIRCLE 386 ON READER SERVICE CARD

Smith Corona
65 Locust Avenue
New Canaan, CT 06840
(203) 972-1471
CIRCLE 387 ON READER SERVICE CARD

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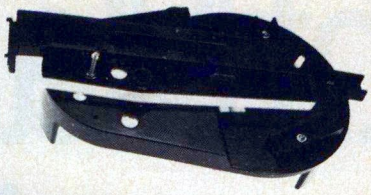

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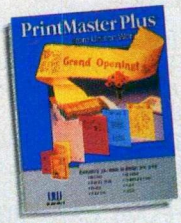

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Before we say more, we have to tell you about the unique PrintMaster Plus previewing capability. While other programs let you preview a project at the end, PrintMaster Plus lets you select design elements in any order and preview your creation at any time, exactly as it will appear printed — truly the ultimate in creative freedom.

With PrintMaster Plus one program does it all — cards, banners, posters, stationery, even calendars.

As an added bonus, you can mix two different graphic elements on posters and banners (while other programs may limit you to one). Each font can be sized small or large. There's even a special, small-sized font so you can fit more lines of text into your masterpiece.

PrintMaster Plus lets you create, preview, and make changes at any step.

If you like freedom of expression, insist on PrintMaster Plus the next time you visit your software dealer. When all is said and done, you'll be glad you did.

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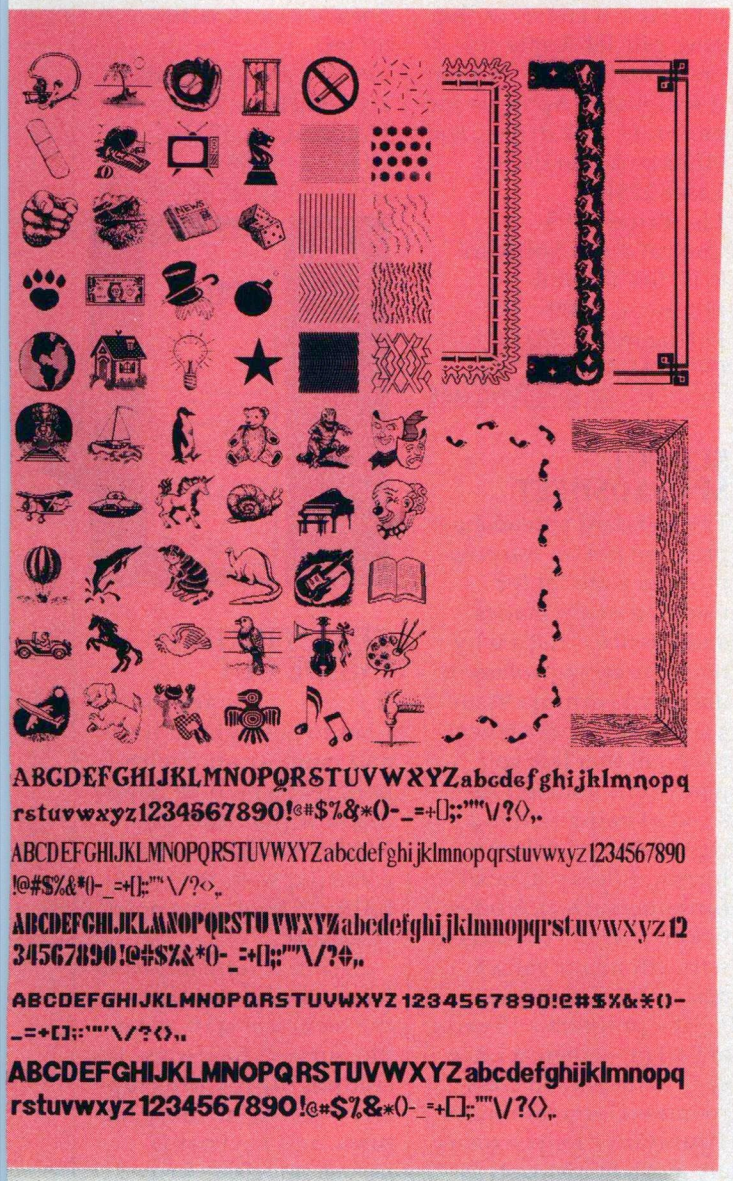

elements, type fonts and borders ever offered together ad to your software dealer and compare!

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PrintMaster Plus is available for Apple® IIc, IIe, II+ with 128K and many other computers. For the name of the PrintMaster Plus dealer nearest you or for more information, call Unison World at 415-848-6666.

Aa

PrintMaster Plus gives you both capital and lower case letters to work with, while other programs may limit you to all caps.

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CARD NO. _____ EXP DATE _____

SIGNATURE _____

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2150 Shattuck Ave., Suite 902, Berkeley, CA 94704

CIRCLE 113 ON READER SERVICE CARD

PICK OF THE CROP

BY DENISE CARUSO AND LISA RALEIGH

Faster clones, simpler spreadsheets, safer files, and more of everything for Apple II aficionados

PRODUCT SPOTLIGHT

'EX' STANDS FOR EXTRA

Like any good CPU, the Laser 128 Apple II clone has been updated. The new version, called the Laser 128EX, gives you a significant bump up in speed and memory capacity. When you're at the Laser 128EX keyboard, you can switch among three processing speeds—1 MHz (regular Apple II speed), 2.3 MHz, or 3.6 MHz (about 40% faster than the fastest Apple II, the IIGS). However, keep in mind that the EX's ROM will run at only 1 or 2.3 MHz, so if you're running at 3.6 MHz, the system will temporarily slow down when accessing ROM. This means that BASIC programs will show almost no speed difference between 2.3 and 3.6 MHz. Assembly-language programs, though, will run at full speed.

The EX also starts you off with 256K of RAM, expandable to one megabyte. It also comes with a built-in Universal Disk Controller that lets you connect just about any Apple 5¼- or 3.5-inch disk drive (including Macintosh drives) to the EX's two drive connectors. And it comes in the new, official Apple color—"platinum"—so that it will match Apple's new monitors, disk drives, and other peripherals.

Laser 128EX
List Price: $495
Central Point Software
9700 SW Capitol
Highway #100
Portland, OR 97219
(503)244-5782
CIRCLE READER SERVICE NO. **405**

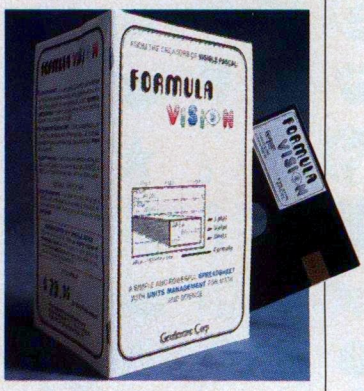
SCHOOL SPREADSHEET

The standard spreadsheet program is a bit too complicated a model for teaching mathematics and science. That's why two education professors designed Formula Vision, a simplified spreadsheet program that lets you name cells yourself instead of being tied to a rigid row-and-column format. It lets you label formulas such as Area = Height × Width on-screen, with attendant values and units of measure.

The program's 15 cells are all on-screen at once, easy to display in classrooms on large monitors. Twenty-five help screens are available, as well as pull-down tools and file utilities.

It also can handle a wide variety of problems found in the school setting—from rate and distance problems to mathematic modeling of bacterial growth. The program includes sample templates for a variety of subjects, from mathematics to chemistry, and the company permits unlimited disk duplication, even though the software is already offered at a ridiculously low price.

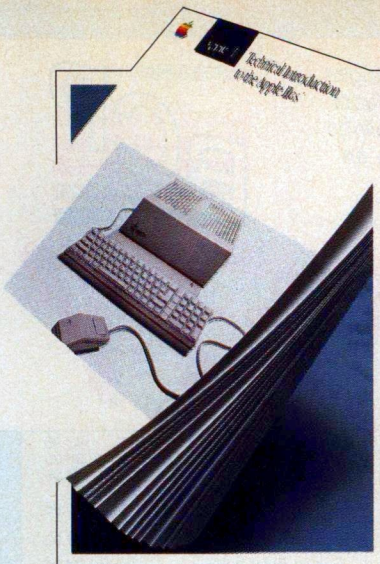
Formula Vision
List Price: $29.95 for entire school
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one 5¼-inch disk drive. Pascal; not copy-protected; does not work with mouse.
Gentleware Corporation
2509 Saginaw Trail
Maitland, FL 32751
(305) 628-4608
CIRCLE READER SERVICE NO. **406**



TURN THE IIGS INSIDE OUT

If you're the type who likes to get right in there and muck around with both feet, you'll be happy to know that Addison-Wesley Publishing has come out with the "definitive" book on Apple's newest II.

Technical Introduction to the Apple IIGS, written by the technical staff at Apple, surveys hardware, including the 65C816 chip architecture, memory features, and keyboard/mouse interface; firmware, including resident desk accessories and input/output routines; the toolbox, which is similar to the Mac toolbox; the IIGS's native 16-bit mode or 8-bit emulation; and the development envi-



ronment, including the IIGS Programmer's Workshop.

The book also compares the IIGS, Apple IIe, and Macintosh for anyone thinking about an upgrade. Though written primarily for programmers and developers, the manual has charts, tables, and diagrams that nontechnical enthusiasts can use without intimidation.

Technical Introduction to the IIGS
List Price: $9.95
Addison-Wesley
Publishing Company
Reading, MA 01867
(617) 944-3700
CIRCLE READER SERVICE NO. **407**

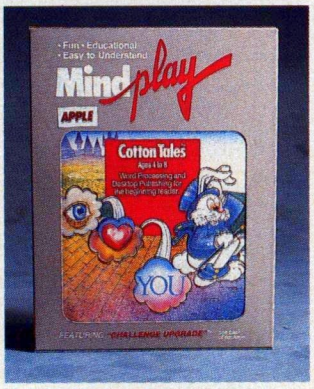
PRECOCIOUS PUBLISHING

Perhaps you hope to give your young ones a head start in creative writing. If so, you may be interested in Cotton Tales, a "word processing and desktop publishing" program designed for children ages 4 to 8.

If they can't read yet, don't worry. The program uses a "bunny cursor" and helps budding creative writers along by letting them express themselves in either pictures or words. The words may come easier and sooner as tykes use a built-in picture translator that helps them see how pictures are represented by words. And they can use the picture menus to get the hang of entering pictures or words, inserting, copying, erasing, and using disk utilities.

Teachers who use Cotton Tales can make worksheets that include space to type in the students' assignments, and six different grid formats.

Cotton Tales
List Price: home edition, $39.99; teachers' edition, $49.99
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one 5¼-inch disk drive. DOS 3.3; copy-protected; can work with mouse.
Mindplay
Division of Methods & Solutions, Inc.
82 Montvale Avenue
Stoneham, MA 02180
(800) 221-7911
In MA (617) 438-5454
CIRCLE READER SERVICE NO. **408**



LIFEGUARD, SAVE MY FILE

Just about everyone has had the demoralizing experience of accidentally deleting a file. Now IIGS owners can breathe easier, knowing they can restore zapped files with a new utility program called LifeGuard. LifeGuard works under ProDOS 16 but is capable of recovering both ProDOS 8 and ProDOS 16 files. As a true GS program should, LifeGuard uses the mouse interface plus pull-down menus and dialog boxes to get the job done. Not only can it recover deleted data, but it can also search a disk for either filenames or any data string, meaning either text or binary code. LifeGuard also has special search utilities for AppleWorks files. These search capabilities are handy if you're weary of dealing with directories and subdirectories.

Lifeguard
List Price: $59.95
Requires: Apple IIGS, 3.5-inch disk drive, mouse. ProDOS 16; not copy-protected.
Harbor Software
403 Great Road #8
Acton, MA 01720
(617) 263-1870
CIRCLE READER SERVICE NO. **409**

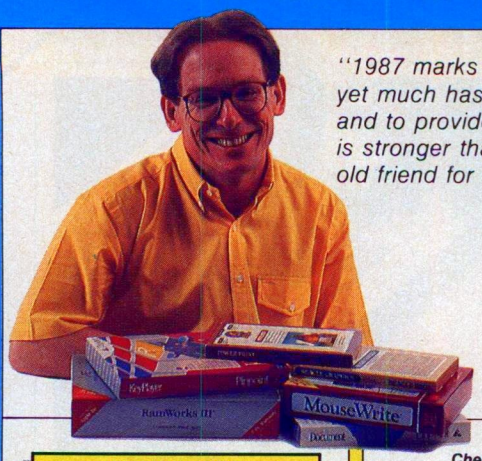
TWO IN ONE

OK, folks, whaddaya wanna call it? A mouse-stick? Or perhaps a mouse-sticle, à la Kliban's mousesicles? Unfortunately, the real name is much more ordinary: It's called Mach IV, and its unique joystick-and-mouse combination is making some people sit up and take notice.

The mouse-stick's joystick has all the good features—it's easy to adjust and has big fire buttons, accurate movement, and a stainless-steel movement ball. To use the mouse part, you activate a switch on the bottom, and then point with the joystick and select with the buttons. This combination might be handy for frequent joystick users who want to save desk space and who also work with spreadsheets and word-processing programs.

Mach IV, not surprisingly, comes from the same people who make Mach II and III joysticks.

Mach IV
List Price: $89.95
Requires: Apple II Plus or IIe with mouse-interface card, or IIc (works with IIGS as joystick only)
CH Products
1225 Stone Drive
San Marcos, CA 92069
(619) 744-8546
CIRCLE READER SERVICE NO. **410**



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ML 82A, 92, 93 (Black)	13.95
ML 192, 193 (Black)	32.95

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Sider 20mb System	598.95

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Mach 4's IIE, IIC	59.95
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Turbo Mouse	89.95
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512k	248.95
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Transwarp	229.95

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CX	
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Apple	
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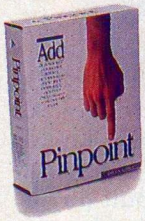

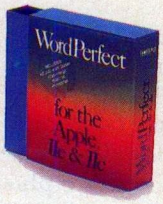

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Imagewriter II 10"	499.95

Okidata

ML 192+ (200 cps) 10"	359.95
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BUSINESS

Activision

Writers Choice (GS)	61.95

ALS

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Apple

Appleworks	198.95

BPI

AR, GL, PR, AP, IC (ea)	148.95

Broderund/Bankstreet

Bank St. Writer Plus	51.95
On Balance	61.95

Computer Associates

SuperCalc III A	124.95

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Microsoft

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Catalyst, Word Juggler 3.0 (ea)	58.95

Roger Wagner

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Sensible Software

Bookends—Ext.	81.95
Sensible Grammar	55.95
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Activision

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Baudville

Award Maker Plus GS	23.95

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Toy Shop	38.95
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Central Point

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Data Transforms

Fontrix	61.95

Electronic

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Deluxe Art V1, V2 GS	24.95
Music Const. GS	35.95

Epyx

Create a Calendar	22.95
Graphic's Scrapbooks (ea)	17.95

Funk

Sideways V 2.0	38.95

Pinpoint

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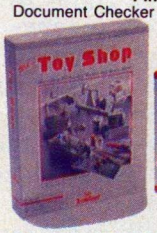

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Keyplayer	30.95
Pinpoint Starter Kit (GS)	82.95
Pinpoint	48.95
Pinpoint Ram Exp.	24.95
Pinpoint Spellchecker	44.95
Pinpoint Toolkit	30.95
ProFiler V2.2	51.95
RunRun	30.95

Roger Wagner

Merlin	41.95
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Merlin Combo	68.95
Merlin Pro	64.95

Software Touch

Autoworks, FontWorks (ea)	33.95
Grafix Pro	19.95
Program Writer	33.95

Spinnaker

T-Shirt Shop	31.95
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Springboard

Certificate Maker	29.95
Certificate Maker Lib #1	20.95
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Newsroom Clip Art V1, V3 (ea)	17.95
Newsroom Clip Art V2	24.95
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Topdraw GS	64.95

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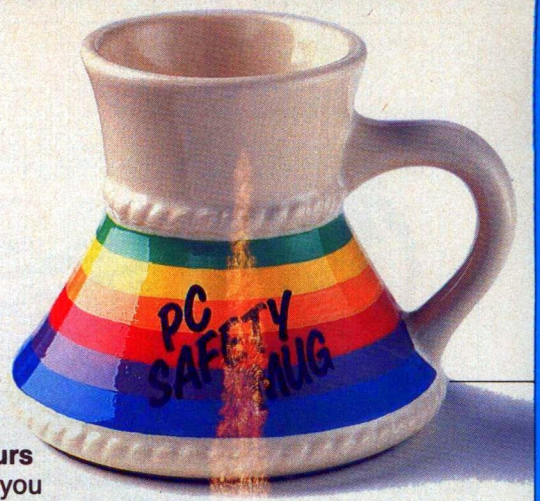

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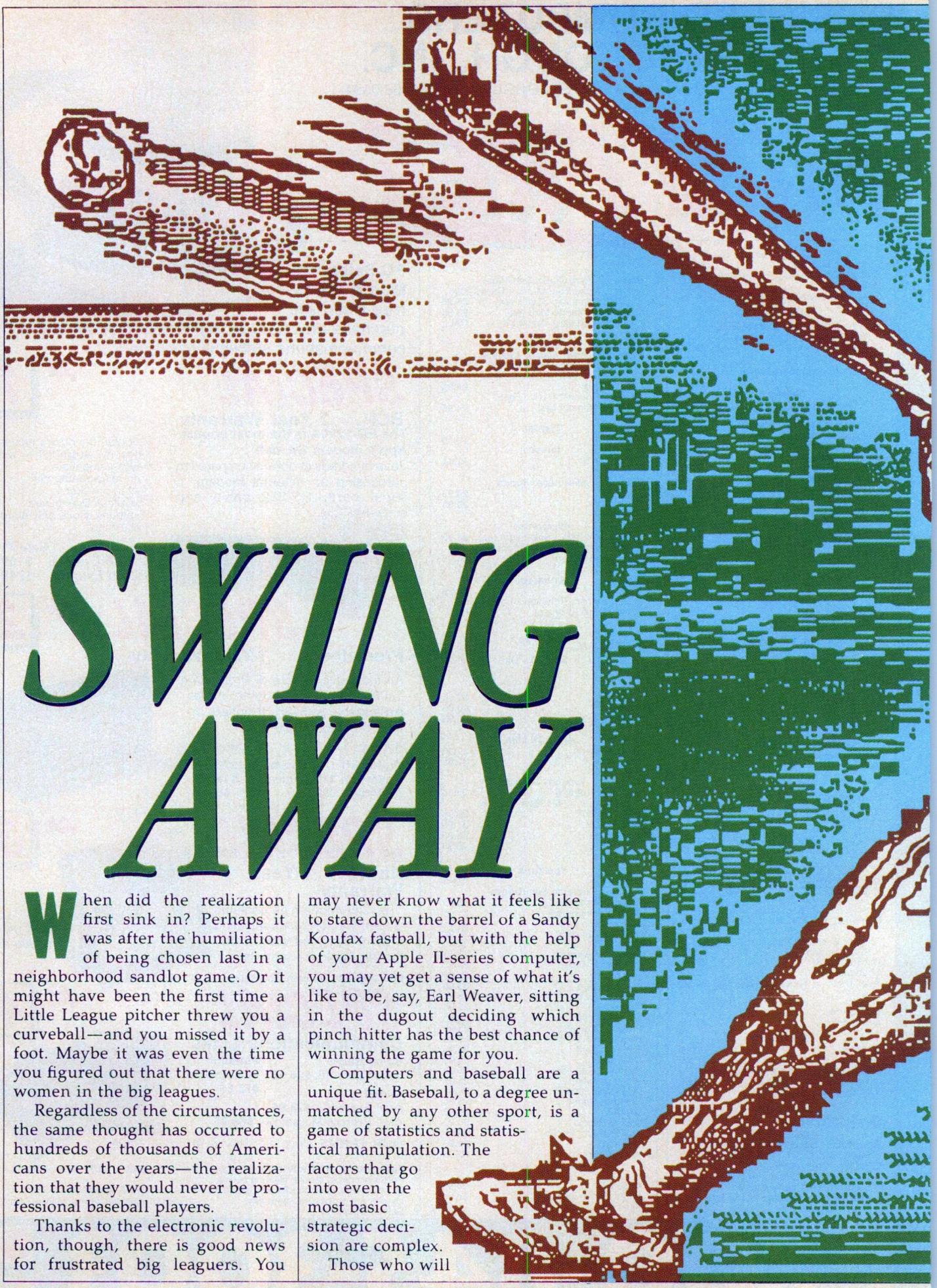

SWING AWAY

When did the realization first sink in? Perhaps it was after the humiliation of being chosen last in a neighborhood sandlot game. Or it might have been the first time a Little League pitcher threw you a curveball—and you missed it by a foot. Maybe it was even the time you figured out that there were no women in the big leagues.

Regardless of the circumstances, the same thought has occurred to hundreds of thousands of Americans over the years—the realization that they would never be professional baseball players.

Thanks to the electronic revolution, though, there is good news for frustrated big leaguers. You may never know what it feels like to stare down the barrel of a Sandy Koufax fastball, but with the help of your Apple II-series computer, you may yet get a sense of what it's like to be, say, Earl Weaver, sitting in the dugout deciding which pinch hitter has the best chance of winning the game for you.

Computers and baseball are a unique fit. Baseball, to a degree unmatched by any other sport, is a game of statistics and statistical manipulation. The factors that go into even the most basic strategic decision are complex.

Those who will

ILLUSTRATION BY LAX JANSEEN

RECREATION
BY RICH JAROSLOVSKY

Six computer baseball games that put you into a big-league dugout

never sit in a major-league dugout may never come closer to the real thing than they can with one of the several baseball-strategy simulations available for Apple II-series computers. These games vary greatly in complexity and verisimilitude, but all share common ancestors in the tabletop board games of baseball strategy that have been available for many years. Like these games, the computer simulations use a variety of statistics—on hitters, pitchers, and fielders—to establish probable outcomes on each given play, yet these computer simulations can vary widely in degree of accuracy, realism, and decision-making latitude for the "managers"—to say nothing of their differences in price.

By analyzing individuals' performances in enough detail and enough situations, a programmer should be able to make a computer game reproduce a player's—and a team's—basic performance and characteristics. Computer versions of Reggie Jackson should pound a good many home runs but strike out with frequency. Willie Mays should cover vast territory in center field, making catches and throws that other players can't. Fernando Valenzuela should be an ace in anybody's league.

That isn't to say, however, that a good simulation should slavishly copy a team's real-life record; in-

SOFTWARE STATS

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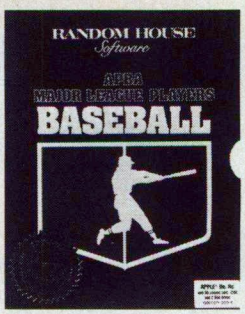

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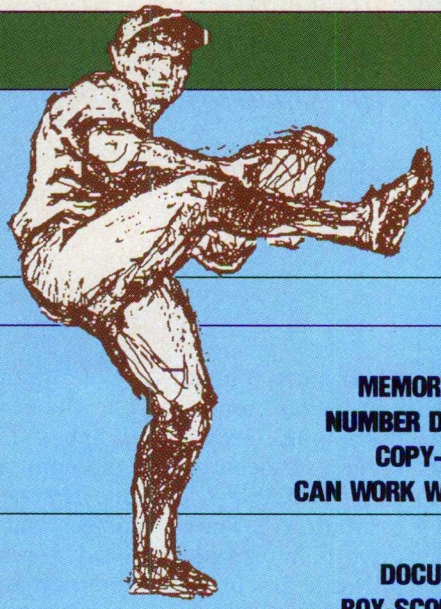


PROGRAM	MICROLEAGUE BASEBALL	APBA MAJOR LEAGUE PLAYERS BASEBALL
COMPANY	MicroLeague Sports Association 2201 Drummond Plaza Newark, DE 19711 (800) Playbal (orders only) (302) 368-9990	Random House Software 400 Hahn Westminster, MD 21157 (800) 638-6460 In MD (800) 492-0782
PRICE	$39.95	$59.95
CPU	Apple II Plus, IIe, IIc, or IIGS	Apple IIe or IIc
MEMORY REQUIRED	48K	128K
NUMBER DISK DRIVES	1 5¼-inch	2 5¼-inch
COPY-PROTECTED	Yes	Yes
CAN WORK WITH MOUSE	No	No
GRAPHICS	Good	No
DOCUMENTATION	Good	Excellent
BOX-SCORE QUALITY	Optional	Excellent
AUTOMATIC PLAYER-STAT UPDATE	Optional	No
DRAFT/CREATE TEAMS	Optional	Yes
PLAY VS. COMPUTER OPTION	Yes	No
CIRCLE READER SERVICE CARD NO.	360	361

deed, the pleasure of these games often comes from second-guessing your real-life managerial counterparts, using the same cast of characters in more imaginative ways. Indeed, at this very moment, a good many aspiring John McNamaras may be sitting at their keyboards, preparing to insert a late-inning defensive substitution for Bill Buckner in the sixth game of the 1986 World Series. Perhaps if the real McNamara had had access to a computer, the Boston Red Sox would be world champions today.

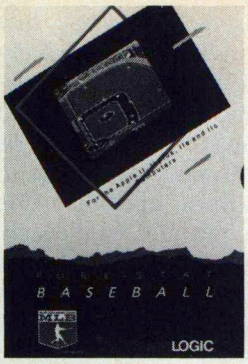
1 MicroLeague Baseball

Boot up MicroLeague Baseball, and you are suddenly in control of your own televised Game of the Week—right down to the national anthem. Just before play begins, your computer belts out the last few bars of "The Star-Spangled Banner"—unless Toronto or Montreal is the home team, in which case the tune is "O Canada." During the seventh-inning stretch, players are serenaded with, of course, "Take Me out to the Ball Game." Like most other games, MicroLeague offers you the option of managing against the computer.

MicroLeague's color graphics are a marvel. When the ball is hit, players move smoothly to run and field. A text window in center field provides a running, if limited, commentary on the game; a good catch, for example, may warrant a "Holy Toledo!"

As in other baseball simulations, managers select a starting lineup from a team roster that the game provides. Once play is under way, the managers take turns entering commands on the keyboard. The offensive manager can order his batter to swing away or bunt and can make tactical calls such as directing his base runners to steal, to try for an extra base on hits, or to play it safe. The defensive manager calls for the type of pitch—fastball, curve, slider, change-up—and also controls such factors as pitchouts, intentional walks, and bringing the infield in.

Thanks to MicroLeague's visuals, the game is always totally involving, but it suffers from a certain lack of realism. Outfielders drop far too many fly balls in MicroLeague Baseball; pitchers, on the other hand, never make errors. Players are never injured or eject-



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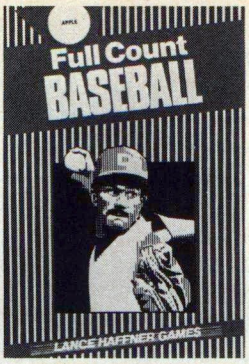

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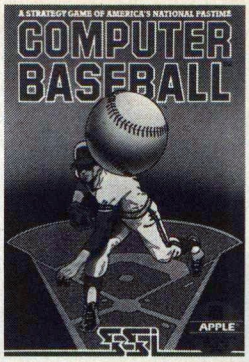

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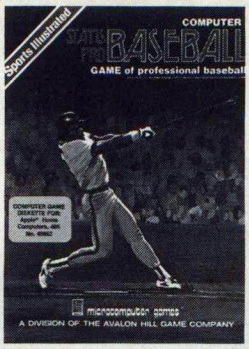

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PURE-STAT BASEBALL	FULL COUNT BASEBALL	COMPUTER BASEBALL	COMPUTER STATIS PRO BASEBALL
SubLogic Corporation 713 Edgebrook Drive Champaign, IL 61820 (800) 638-6460 In MD (800) 492-0782	Lance Haffner Games P.O. Box 100594 Nashville, TN 37210 (615) 242-2617	Strategic Simulations, Inc. 1046 North Rengstorff Avenue Mountain View, CA 94043 (415) 964-1353	The Avalon Hill Game Company 4517 Harford Road Baltimore, MD 21214 (301) 254-5300
$49.95	$39.95	$14.95	$35.00
Apple II Plus, IIe, IIc, or IIGS 64K 1 5¼-inch Yes No	Apple II Plus, IIe, IIc, or IIGS 64K 1 5¼-inch No No	Apple II Plus, IIe, IIc, IIGS, or III 48K 1 5¼-inch Yes No	Apple II Plus, IIe, IIc, IIGS, or III 48K 1 5¼-inch Yes No
Yes Excellent Poor Yes Yes Yes	No Poor Excellent Yes Yes Yes	Minimal Good Good No Yes Yes	Minimal Poor Good Yes Yes No
362	363	364	365

ed. And because the offense chooses its play first, an alert defensive manager always knows when a steal or hit-and-run is on and can spoil it by pitching out.

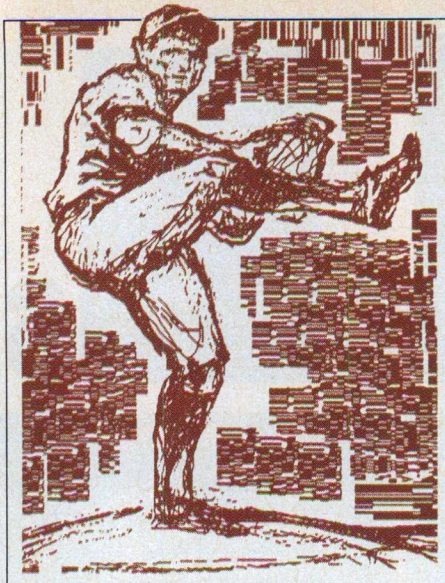
One of the strengths of MicroLeague—the availability of various add-on products to enhance and customize the game—is also a weakness. MicroLeague comes with statistics for selected World Series teams of the past; other disks including year-by-year statistics for all teams, or great teams of the past for a single franchise, are available at $19.95 apiece. A Statistics/Compiler disk, which prints out an accurate box score of each game and lets you save cumulative team statistics to disk—a must if you want to manage a full season of your favorite team—is $24.95. A General Manager/Owner disk, for making roster changes, is $39.95. Thus, it's easy to spend $120 or more on a MicroLeague Baseball configuration—a steep tab indeed to obtain the functions that many other games include in their base price.

2 APBA Baseball

For 35 years, APBA Baseball (*ap-ba* to aficionados) has been among the most popular tabletop baseball simulations. Its effects are almost hypnotic. During the darkest days of Watergate, presidential son-in-law David Eisenhower escaped the pressures of an unraveling White House for hours on end by playing the board game. Now comes APBA Major League Players Baseball. For statistical accuracy and taking full advantage of the computer's number-crunching ability, APBA is unmatched. The game comes on three diskettes, two of which are in the computer at any given time; on one side is a set of utilities for drafting players and running an entire league.

In visual terms, APBA is quite the opposite of MicroLeague. The program's sole use of graphics consists of a flashing HOMER after a home run. Otherwise, APBA is entirely text. The names of fielders appear in a diamond-shaped pattern on the screen, along with codes that indicate their fielding and throwing skills. The batter's name appears to the left or right of home plate, depending on which side he swings from.

If the APBA display is primitive,



For statistical accuracy and taking full advantage of the computer's number-crunching ability, APBA is unmatched.

that is only because every spare kilobyte of memory is dedicated to recreating accurately the reality of baseball. Besides providing basic statistics, the program rates each player on such attributes as ability to hit against left-handed or right-handed pitching; ability to bunt and execute the hit and run; how prone he is to injury; ratio of stolen-base attempts to successes; and—for pitchers—control, stamina, and even quality of pickoff move. During the course of a game, managers may face scores of small decisions: whether to bring the infield in, whether to wave a runner home from third on a fly, whether to cut off a throw from the outfield. In the center of the screen, a vivid running commentary keeps managers apprised of the progress of play; you even get an "instant replay" key for reliving particularly dramatic moments. Each batter's and pitcher's statistics for the game thus far are available at any point during play.

At the end of the game, APBA prints out a marvelously extensive box score, including every imaginable hitting, pitching, and fielding category. Curiously, however, the box score fails to award wins, losses, and saves; more importantly, APBA makes no allowance for keeping and updating cumulative statistics on disk, meaning that if you're planning a full season of your favorite team, you'll have to set aside many hours for laborious manual record keeping. Also missing from APBA is a manage-against-the-computer function; if you have no human opponent, you will have to make strategic and tactical decisions for both teams. If you can live with those shortcomings, however, and have a vivid enough imagination to translate the words on the screen into the mental picture of a game, APBA is hard to beat.

3 Pure-Stat Baseball

A new entrant in the computer-baseball wars, from the people who brought us Flight Simulator II, is Pure-Stat Baseball. In many ways, Pure-Stat attempts to combine the approaches of APBA and MicroLeague. It evaluates players on a statistical level worthy of, and in some cases even more extensive than, the APBA game; at the same time, the company recommends a color monitor and promises an optional Stadium Disk—à la Flight Simulator's scenery disks—to allow play in any major-league ballpark.

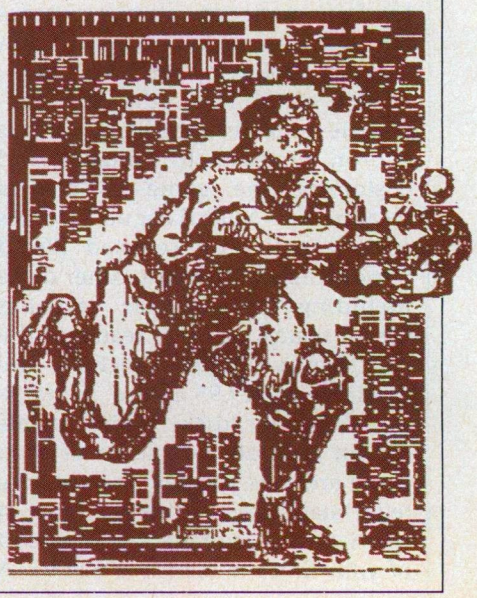
When the statistics are available, Pure-Stat incorporates a hitter's real-life performance individually against left-handed and right-handed pitching, and a pitcher's performance against left-handed and right-handed hitters. This feature allows a measure of realism that even ABPA—which uses a less precise lefty-righty allowance—can't match.

Play begins with an all-text screen that gives a detailed rundown of the current batter/pitcher matchup, as well as a scoreboard and other relevant information. Pure-Stat Baseball gives computer managers control over a greater range of decisions than that of any other simulation. Each manager, in turn, steps through a series of menus. Offensive managers first decide from among eight batting options, including Bat Cautiously (providing a greater chance for a walk but making extra-base hits less likely), Swing Aggressively (increasing the odds for both an extra-base hit and a strikeout), and Hit behind the Runner, as well as the standard Swing Away, Bunt, and Hit-and-Run options. The manager then becomes base coach, deciding whether runners should steal or try to take an extra base on a hit. One neat feature is the ability to instruct players to run aggressively only if the ball is hit to a certain outfielder—say, a right fielder with a poor arm rating.

Defensive managers have to step through their own series of menus to control pitching and fielding behavior. They can order hurlers to pitch normally or aggressively (which increases chances for both strikeouts and extra-base clouts) or to pitch around the batter (more chance of a walk, less of a crippling hit). Infielders and outfielders can be positioned and instructed on tactics, depending on the situation.

Once the managers have made

Despite its graphic shortcomings, Pure-Stat has some features that none of the other games can match.



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Other MicroLeague Disks — World Series teams, All-Star Rosters, Season Disks with all 26 teams ($19.95)
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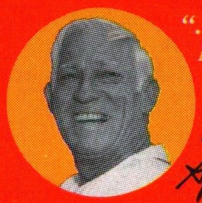

". . . when I played MicroLeague — it was like being in my own dugout!"

"Sparky" Anderson
Manager, Detroit Tigers

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all the choices on the text screen, the action switches to a full-color-graphics field. If you've loaded a custom stadium from a disk, the park is realistically represented—say, Yankee Stadium, with its short right-field porch to increase the homer output of left-handed sluggers. The program then executes on the graphics screen the play that has just been selected on the text screen, after which the managers are returned to the text screen for a terse description of the play they just witnessed and the start of the series of menus for the next play.

Pure-Stat's stadium depictions are admirable, as is the program's ability to change viewer perspective between the first- and third-base lines. Otherwise, however, it falls short in its graphic presentation. Compared to MicroLeague, Pure-Stat's players are ghostly figures who move in herky-jerky fashion after a "ball" that looks like a refugee from a 1976 version of Pong. Until you have played the game for quite a while, you'll find yourself waiting for the text-screen description to explain what you just saw. Moreover, the end-of-game box score is a horror of extraneous digits that bears little resemblance to what you might find in the back pages of *The Sporting News*.

Despite such shortcomings, the SubLogic entry has some features that none of the other games can match. For instance, with the display shut down and all timing delays toggled off, the computer can play an entire game by itself in two to three minutes. That may defeat the purpose of allowing managers all those menus and options, but it's a boon to players interested only in results. An extensive set of housekeeping utilities lets you keep player records on disk and update them continuously. You can also trade players to another team or "draft" them to an entirely new one. All told, Pure-Stat would be close to the top of the heap, were it not for its graphic shortcomings.

4 Full Count Baseball

Another recent entrant in the computer baseball sweepstakes is Full Count Baseball. Like APBA Baseball, FCB is a text-and-numbers-only simulation; managers have to provide

Besides taking into account the usual stats, Full Count Baseball ventures into all sorts of exotica.

their own mental imagery based on such prosaic descriptions as "Scosia grounds to C. Brown. Scosia out @ 1B."

FCB comes on two 5¼-inch floppy diskettes—one of them double-sided—with an 11-page, typo-riddled manual. The game's statistical model is among the most elaborate available. Besides taking into account the usual stats on hits, runs batted in, and earned-run averages, FCB ventures into all sorts of exotica. "Park effect triples" makes allowances for the fact that a three-bagger is more likely in, say, Chicago's Comiskey Park than it is across town in the friendly confines of Wrigley Field. "G/A%" is a factor for both hitters and pitchers; it measures the percentage of outs that result from ground balls rather than flies and can be important in determining base runners' advancement. "Era Batting Average" helps equalize the computer's evaluation of players from different generations, so someone who hit .280 in 1967, when the American League average was only .239, would get a little extra credit in statistical matchups with players of other eras.

FCB has other advantages as well. Alone among the games tested, it isn't copy-protected—a boon to owners of hard-disk and 3.5-inch drives. Its built-in rosters—for all 26 1986 clubs, as well as 52 great teams of the past—generally include 28 or 29 players, allowing a more realistic simulation of the farming out, recalling, and trading that real clubs engage in during the season.

FCB also has some major drawbacks. The game's programming "seams" are sometimes visible; BLOAD commands and the like show up on the screen, which is highly unusual in professionally produced software. Worse, hanging up or crashing the game seems unpleasantly easy—if you inadvertently ask for a stored lineup when none has been preselected, for instance. The game-ending box score is admirably detailed, but players are in alphabetical rather than batting order, an annoyance for many purists.

5 Computer Baseball

For a good many electronic-baseball buffs, Computer Baseball was the introduction to the possibilities of computer managing. The game has been around since 1981, and telltale signs of its age abound. Among other things, it offers the option of control by game paddles, which in this age of mouse interfaces seems as quaint as a hand-cranked flivver.

Computer Baseball's graphic display is similarly limited, with a line score across the top of the screen; a primitive depiction of a diamond and players; and information about the batter, pitcher, on-deck hitter, and any bull-pen activity. And, by today's standards, the game can be maddeningly slow, with extensive and time-consuming reading of the disk in crucial situations.

Yet if Computer Baseball now is showing its age, it still remains a marvel in the amount of reality its programmers were able to cram onto a single 5¼-inch disk. The game boasts some features that newer, more expensive programs would do well to emulate—injuries and rainouts, for instance—and it provides one of the most true-to-life challenges for any manager:

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Computer Baseball was the introduction to the possibilities of computer managing.

handling a pitching staff. At the start of the game, the manager can enter how many days' rest each pitcher has had and how many innings he went in his last outing, which determines the adjustment of the pitcher's performance. Once the game starts, the manager can visit the mound for a status report—"Your pitcher is tiring," for example. The manager must direct relievers to start throwing in the bull pen and must monitor their progress; an inadequately warmed-up reliever might get rocked, whereas a hurler left to warm up too long may lose effectiveness sooner than normal once he gets into the game.

Managers also can choose from a variety of hitting, fielding, and running options. Choices include hitting away, bunting, or hitting-and-running for the offensive skipper; the defensive manager positions his infielders—normal, double-play depth, in at the corners, and the like—and instructs his pitcher whether to pitch normally, pitch around the hitter, or walk him. At the end of the game, players get the option of having a box score either on paper or screen; the box score is well detailed, although players aren't listed in batting order. The program makes no allowance for saving and updating statistics on disk.

6 Computer Statis Pro Baseball

Computer Statis Pro Baseball is another old-timer; it has been around since 1983. The game has apparently undergone changes over the years; the program tested is "Revised Version II," although the manual refers to a "Revised Version III" as well.

Statis Pro comes on a single double-sided floppy diskette, with files representing 20 great teams of the past. The manual does double duty for both the Apple and Commodore versions of the game, a considerable distraction in that certain functions are labeled differently on the two machines.

As in the APBA game, Statis Pro has no provision for managing against the computer; solo players have to call the shots for both sides. As in SSI's game, graphics are primitive at best. A stylized green diamond keeps track of base runners, and a blue box contains data on the current pitcher. A continuously updated line score runs across the top of the screen, while a window on the bottom gives the outcome of each play. Statis Pro makes liberal use of sound effects, but many of them sound as though they were intended for a game of Pac-Man or Space Invaders, not baseball. Some may also find the game's use of computerese more than a bit jarring. In Statis Pro the cry isn't "batter up"—it's "input option."

Statis Pro uses a variety of statistics to calculate what it calls the "string" on each player. It evaluates players not just on the standard statistics but also on whether their hits went to left, right, or center fields; how much range afield they had; and, for pitchers, how much stamina on the mound they demonstrated. You initiate most plays by a tap on the space bar, although there are also options for hit-and-run, bunting, and other specialty plays. Injuries, rainouts, and other vagaries of the game are possible. At the end of the game, Statis Pro prints out a usable box score and lets you update team records and save them to disk.

In addition to the games in this article, several arcade-style baseball games are on the market, including Hardball by Accolade, World's Greatest Baseball Game from Epyx, and Gamestar's Championship Baseball. Although these games allow some strategic decision-making, they are principally tests of hand/eye coordination. And, after all, if we had that much hand/eye coordination, we would have been able to hit that Little League curve after all, right? And maybe we would be the ones in against Roger Clemens today, right?

Dreams really do die hard. ✚

Rich Jaroslovsky is a political editor and columnist in The Wall Street Journal*'s Washington bureau and a member of the Society for American Baseball Research.*

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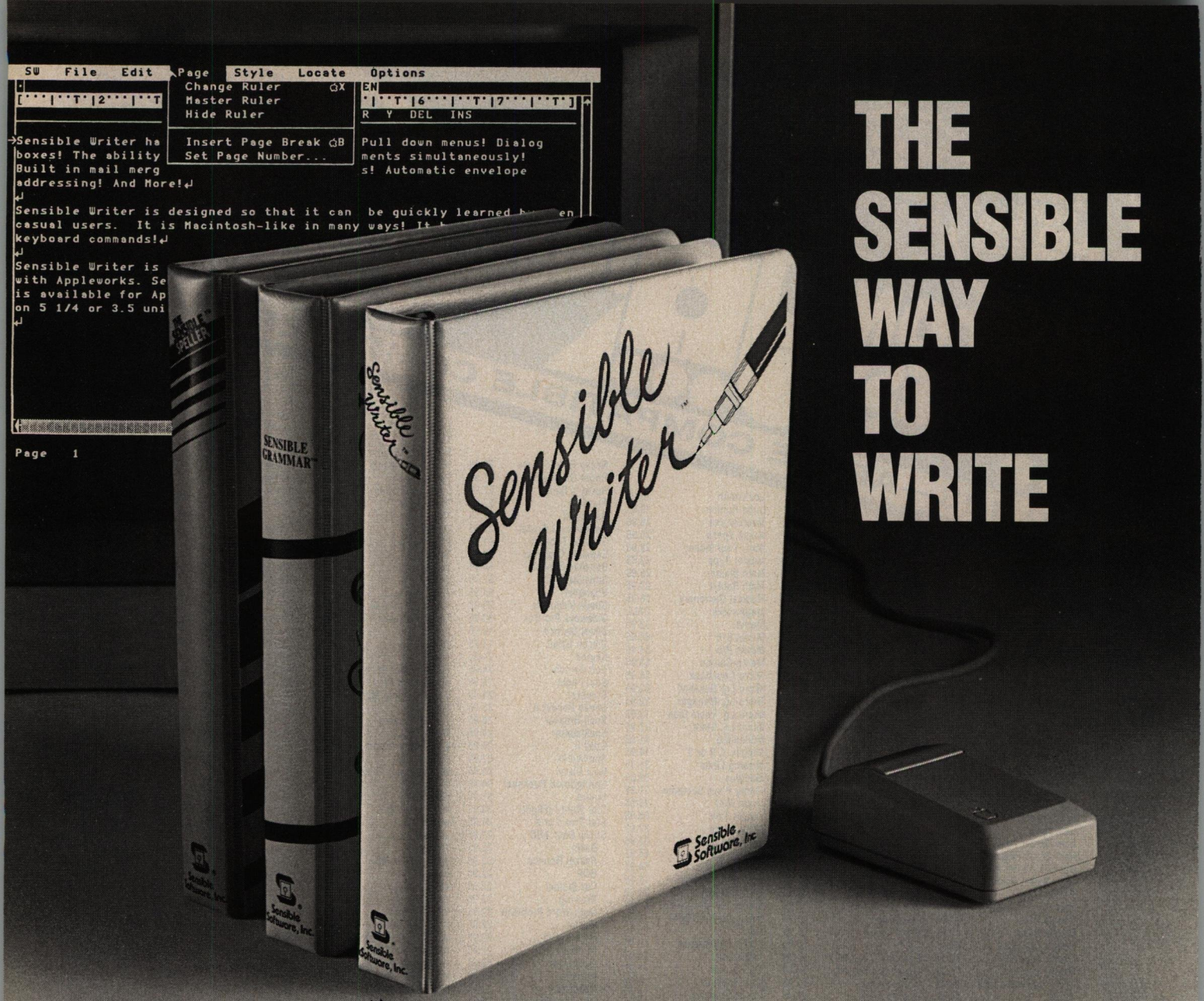

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- Accepts partial payments.
- Automatic posting to General Ledger.
- Prints vendor mailing labels.
- Up-to-date vendor information can be scrolled for review at any time.
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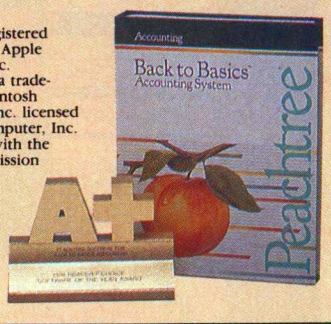

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Figure 1: GraphicWriter's color palette lets you select the color of graphic objects or text.

Figure 2: One of GraphicWriter's strong points is its ability to intermingle graphics with text.

Figure 3: You can import graphics from other Apple IIGS programs into GraphicWriter.

IIGS
UPDATE

BY DAVID D. THORNBURG

A IIGS tool for everything from writing to creating page layouts with color separations

GRAPHICWRITER

As one who uses both a Macintosh and the entire family of Apple II computers, I'm often critical of attempts to create Apple II programs that emulate Macintosh products. Often, many of these programs remind me of little girls who get dressed up in their mothers' jewels and makeup.

I recently changed my mind, however, when I first saw GraphicWriter for the Apple IIGS. This program (created by DataPak Software of Sherman Oaks, California) has some features that I would like to see on my Macintosh document processors.

The glamour and appeal of the Apple IIGS has come from two sources, its Macintosh-like interface and its ability to produce spectacular colors and sounds. One quick way to add glamour to a IIGS program is to make it colorful. Consequently, even word-processing programs for the IIGS offer the ability to create colored text. GraphicWriter offers access to color, and it provides much more, including the ability to create object-oriented and bit-mapped graphics that you can intersperse with text.

The result is a "document"-processing program, not a word-processing program. The program accords equal importance to text and graphics, an approach that distinguishes GraphicWriter from such Macintosh products as MacDraw, which treat text as something that looks nice with pictures, not as the basis for a document. GraphicWriter facilitates a smooth blend of text and graphics, and the result is a tool that you can use for everything from writing a letter to creating page layouts with color separations.

The Supreme Test

The function of a good user interface is to get out of the user's way. With this adage in mind, I subjected GraphicWriter to my usual test: hide the manual, boot the disk, and start working.

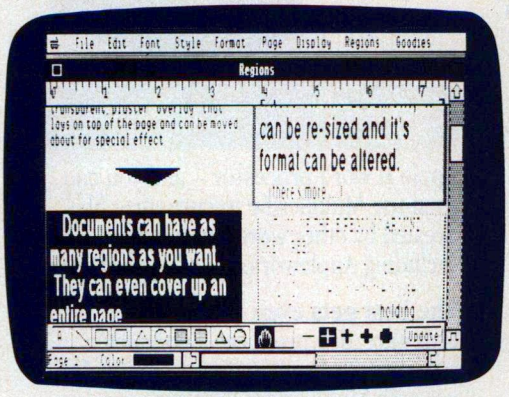

Figure 4: A GraphicWriter document can contain several regions, which are independent panels containing text and/or graphics.

Because this product includes both menus and palettes, I had no trouble finding everything I needed to start creating a text document. GraphicWriter offers several typefaces and typestyles. Some of the fonts are hard to read on the RGB color display, but the fault lies in the IIGS, not in the program. Fonts as small as 9 points (about 1/8 inch) are just too tiny to read on a color monitor with the resolution of the IIGS. The serif fonts (those whose characters have short strokes at the corners) are the hardest to read on the screen unless they appear in the larger type sizes such as 18 or 24 points.

My eyes tended to get tired when I looked at the default 12-point typeface for any period of time, probably because I was looking at black characters on a white background, and the flicker of the white screen was annoying. Fortunately, GraphicWriter lets you reverse the screen to see white characters against a black background, which seemed to help.

After typing a few lines of text, I turned to a palette of graphics tools for creating lines, boxes, circles, and the like. I could draw these figures anywhere on the document, even on top of text. A little more hunting (remember, I hadn't opened the manual yet) revealed a color palette from which I could pick the color of my graphic objects or choose a color for text (see figure 1, facing page).

Next I discovered that colors could completely mask anything they overlaid, could allow dark colors to show through, or could "dye" objects already on the screen. For example,

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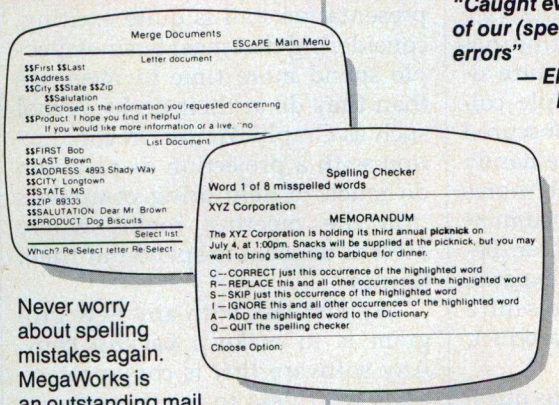

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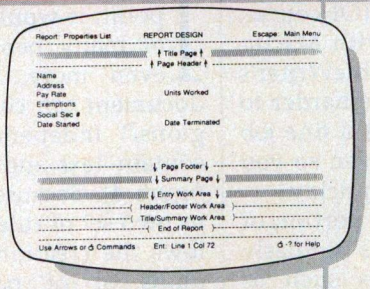

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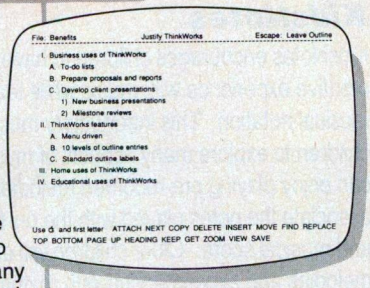
System Requirements: Apple IIe (enhanced), IIc (128K min), IIgs; Two disk drives recommended for ReportWorks and ThinkWorks; Optional: most hard disks, RAM cards, UniDisk 3.5

ThinkWorks $49.95

"A well-made outline processor. . ." ***— A+***



Good planning means success, so ThinkWorks is a must for those reaching for the top. This easy-to-use outlining tool enables you to efficiently organize nearly any type of information — for business, home or school. Outlines can be expanded, rearranged, and merged with familiar AppleWorks commands. Use it by itself or as a powerful add-on tool.

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you can create a headline for a page and place this headline inside a colored rectangle for emphasis. This ability to intermix text and graphics freely is impressive (see figure 2).

I found the user interface to be so intuitive that, with only modest help from sample documents that came with the product, I was able to do everything I wanted without looking at the manual. (Of course, if you're not familiar with Macintosh software, GraphicWriter's functions may be a little harder to learn. DataPak has done a fine job with the manual, however, so you should catch on pretty quickly.)

The word-processing portion of GraphicWriter functions similarly to Macintosh programs such as MacWrite. Each paragraph can have its own settings for margins and format. The usual format options (left, right, center, and full justification) apply on a paragraph-by-paragraph basis. Each new paragraph inherits the settings for the previous paragraph, so you have to make changes only when they are called for. The program provides both standard and decimal tabs, making it easy to create nicely formatted tables.

You can import pure-text documents, as well as Apple IIGS graphic images, into GraphicWriter, meaning that you can use it as a page-layout tool for documents created with other programs (see figure 3).

If GraphicWriter stopped at this point, it would meet the needs of many people, but it offers even more. A GraphicWriter document can contain several "regions," independent panels that contain text and/or graphics (see figure 4). Because each region has its own set of rulers, this feature allows the creation of multiple columns or of partially obscured pictures and text fields. One handy use for regions is as "Post-It" notes that you can place over a document for someone else to read later. Because you can add, move, expand, or erase regions, they represent a powerful extension to this product.

How Will It Be Used?

The obvious answer to this question is that GraphicWriter will be used to create documents that are ultimately printed on paper, which is only part of the value of this product.

The graphics capabilities and inclusion of large type fonts make GraphicWriter perfect for creating "slide shows" for interactive presentations. You can put together as a single document a sequence of images consisting of text and graphics. By clicking the mouse in the vertical scroll bar, you can jump from "frame" to "frame" to see the next "slide" in the series.

Such a use of GraphicWriter as a presentation tool is quite exciting, considering that most businesspeople spend more time in meetings than they do at their desks. A tool such as GraphicWriter, in conjunction with a projection display, can do much to help bring computers into the meeting rooms where most of us seem to spend our time.

Gripes

My first task with any new program is to make a backup copy. Any software that is copy-protected is worthless to me. I configure my desktop with all the applica-

Here's more you can do with the new Apple II.

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for the Apple IIgs™

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ABKey

ABKey teaches children to recognize letters of the alphabet and develop basic keyboard skills. The program includes many levels of challenge and difficulty. Pictures, letters, and synthesized sounds are used in this program. This program is made even more exciting with the use of high resolution color graphics and sound.

KidsNotes

KidsNotes encourages children to have a positive and creative experience with music while learning the basics of musical notation. This introductory music program allows children to explore many aspects of music. Younger children can enjoy playing pre-recorded melodies. They also learn to associate the notes played with the on-screen piano keyboard and musical score. Older children will enjoy composing simple melodies and experimenting with rhythm, pitch, duration, tempo, volume, simple time signatures, and simple key signatures.

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tions I use on one disk, and I am fed up with paying for the fact that some people gladly break federal laws to distribute copied software to their friends. To my displeasure, I discovered that GraphicWriter was copy-protected. Fortunately, DataPak Software does provide you with a free backup copy of the program disk on return of the warranty card.

In general, DataPak is anxious to keep its customers happy and is considering removing copy-protection altogether. Another way DataPak serves its customers is to provide them with free upgrades of the program. All owners of GraphicWriter should send in their product-registration cards so the company can contact them when new releases are ready. With GraphicWriter, this policy has been especially important because the first version of the program was able to print only in the Draft mode. The new version (and free update) now prints in the High-Quality mode.

Although I have been skeptical of attempts to create Mac-like products that run on Apple II-series computers, GraphicWriter for the Apple IIGS has convinced me to change my view. Its defects (except for copy-protection) come more from the computer's limitations than from any failures on the part of the developers. I hope you'll notice such attention to detail as more IIGS software comes to the marketplace. +

David Thornburg is a regular contributor to this magazine and is the designer of Calliope, a nonlinear idea processor for the Macintosh and Apple II series of computers.

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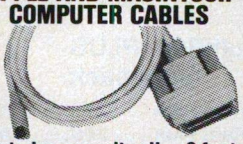

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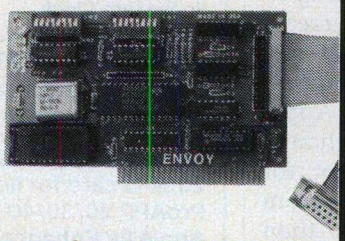

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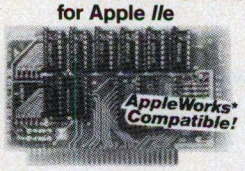

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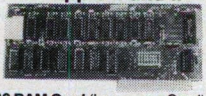

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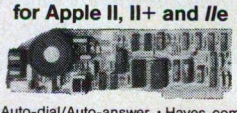

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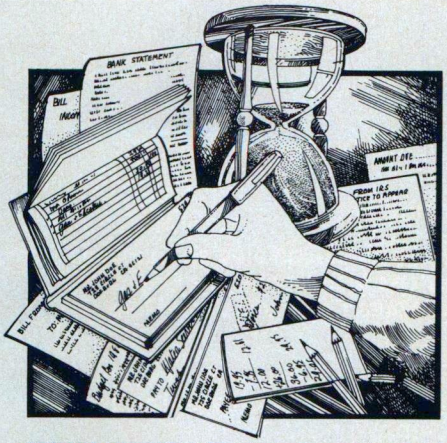

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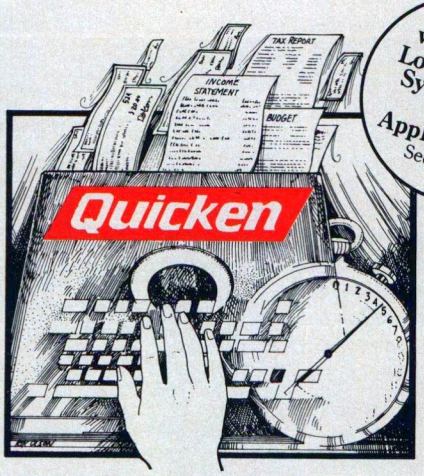

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FEATURE REPORT
USING THE @IF FUNCTION

HELP FILE
QUESTIONS FROM OUR READERS

A+ APPLEWORKS REPORT

A guide to the @IF function in the spreadsheet module and questions from our readers

FEATURE REPORT *BY CHARLES RUBIN*

WORKING WITH IF

The @IF function in the AppleWorks spreadsheet module lets you teach the spreadsheet program to decide which of two results to produce, depending on the result of a logical test. This simple but powerful function lets you add an extra level of automation to many spreadsheets.

If you're determining the discount on merchandise you sell at various volumes, for example, you can use an IF formula to determine when discounts are applicable and then calculate them automatically. Or if you have worked out a formula for giving employee bonuses based on certain conditions, you can let the IF function apply those conditions and calculate the bonuses for you.

Just about every spreadsheet program includes the @IF function, and AppleWorks' is no exception; in AppleWorks Version 2.0, however, the function has been expanded with the @AND and @OR functions. Once you learn how valuable @IF can be, you may want to upgrade to the latest version of AppleWorks so you have even more power.

@IF in General

The basic form of @IF formulas is @IF(logical test,result if condition true,result if condition false).

An @IF formula produces one of two results, depending on whether the logical test it applies proves true or false. Like other spreadsheet functions, the formula begins with the function name itself, followed by the function's argument (the mathematical expression on which the function operates) inside parentheses. With @IF formulas, the argument contains a logical test, a value that the formula returns if the test is true, and a value it returns if the test is false. These three elements must be separated by commas, with no spaces in between. To construct logical tests, you use these logical operators:

< Less than
>Greater than
<= Less than or equal to
>= Greater than or equal to
= Equal to
<> Not equal to

You use @IF formulas in any spreadsheet situation that has two possible outcomes and you want AppleWorks to decide which one is appropriate. Here's a simple example: Suppose you have an order form for your novelty business, and you want it to calculate discounts automatically on quantity orders. Each time you get an order, you enter the unit price of each item and the quantity ordered. You then want AppleWorks to determine whether there's a discount on the order and calculate the total

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CIRCLE 239 ON READER SERVICE CARD

Pinpoint

price of the items ordered. The final spreadsheet for this situation is shown in figure 1. Here, you've decided that orders of 500 items or more deserve a 10% discount, so you'll offer them at 90% of the regular price. Orders under 500 are sold at full price, or 100%. These discounts appear in the Discount Schedule in rows 13 and 14.

The @IF formula here is in cells D4, D5, D6, D7, and D8. It is essentially the same formula that has been copied (with relative references) from cell D4 down through D8. The formula determines whether the order quantity in column C is greater than 500 and then enters the appropriate discount, depending on the result. This is the formula in D4:

@IF(C4<500,D13,D14)

This formula says: If the value in cell C4 is less than 500, enter the value from cell D13 (100%). If the value in cell C4 is not less than 500 (i.e., it is 500 or more), enter the value from cell D14 (90%). You use the cell references D13 and D14 instead of the actual values 100% and 90% so you can change the discount rate in D14 and have it automatically reflected by the @IF formula. Once the @IF formula determines the appropriate discounted price, a formula in the Total column (column E) multiplies the item's price × the quantity × the discount factor to produce the total.

In the example above, you used the @IF function to return simple values, but you can also have the

```
File: Order Sheet                REVIEW/ADD/CHANGE                Escape: Main Menu
==========A============B============C============D============E==========F====
  1|      Product          Price      Quantity   Discounted        Total
  2|                                                  Price
  3|
  4|Fuzzy Dice            $4.99          100      100.00%      $499.00
  5|Raccoon Tails         $6.99           75      100.00%      $524.25
  6|Shift Knobs          $12.99           50      100.00%      $649.50
  7|Lg. Decals            $2.25          500       90.00%    $1,012.50
  8|Sm. Decals            $1.50          700       90.00%      $945.00
  9|
 10|Total Order                                              $3,630.25
 11|
 12|
 13|Discount Schedule          0-499              100.00%
 14|------------------         500-UP              90.00%
 15|
 16|
 17|
 18|
-------------------------------------------------------------------------------
D9

Type entry or use @ commands                                    @-? for Help
```

Figure 1: Using @IF to calculate discounts automatically on quantity orders

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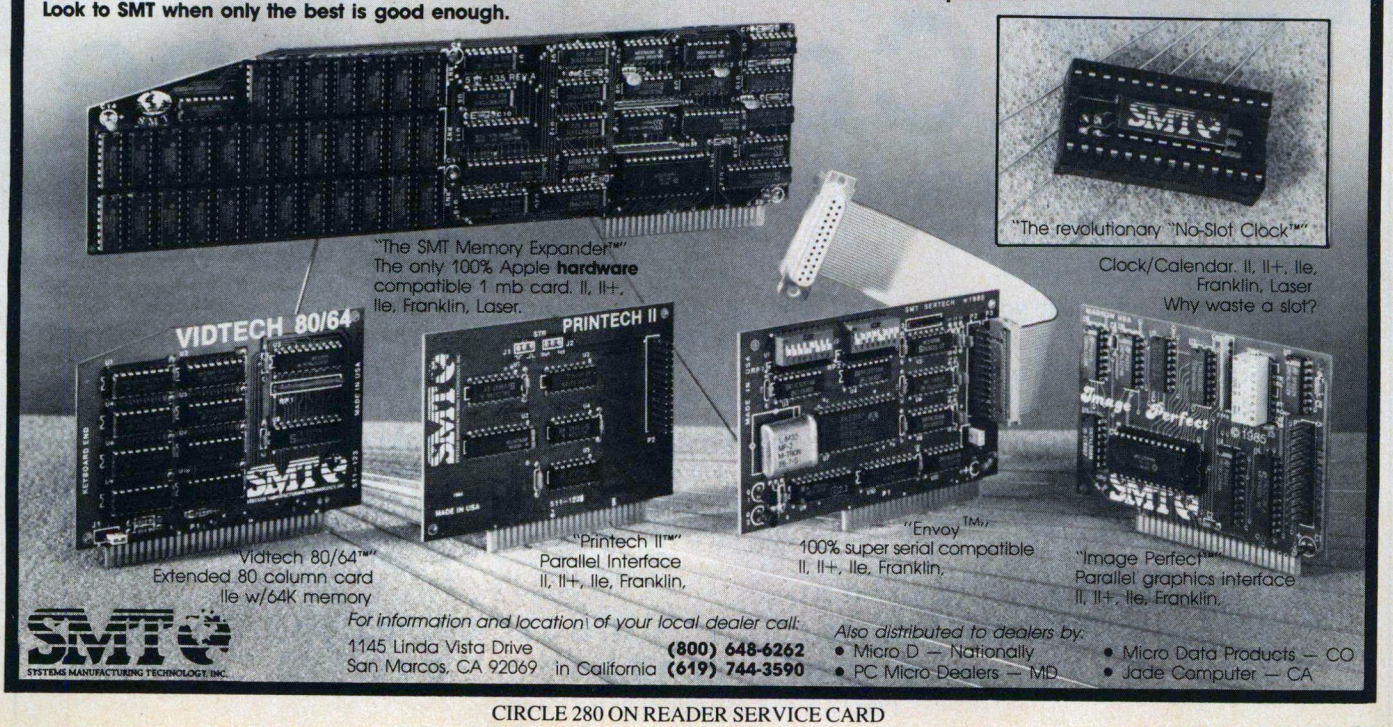

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CIRCLE 280 ON READER SERVICE CARD

function perform different calculations, depending on whether the logical test proves true or false. A ledger that mirrors a typical checkbook register is a good example. As you can see in figure 2, this spreadsheet has separate columns for expenses and deposits, just as in a checkbook. Although you know that deposits must be added to the balance and expenses must be subtracted, AppleWorks doesn't have a clue: You must give it this knowledge with the @IF function.

The @IF formula here is in cells E4 through E11 (the value in E3 is simply a value, since it is the forwarded balance). The formula in E4 is @IF(C4>0, (E3–C4), (E3+D4).

The formula says: If the value in C4 is greater than 0, then subtract the value of C4 from the previous balance in E3. If the value in C4 is not greater than 0, then add the value of D4 to the previous balance in E3. This @IF formula works because you always enter expenses in column C and deposits in column D. If you enter an expense in column C, then the value in column C will be greater than zero. If you enter a deposit in column D, there will be no value in column C (AppleWorks treats a blank cell as zero), so the value in column C will not be greater than zero. When it finds a value in column C, then, AppleWorks subtracts it from the previous balance, and when it finds no value in column C, it adds the value in column D (the deposit) to the previous balance.

```
File: Ledger                    REVIEW/ADD/CHANGE              Escape: Main Menu
=========A==========B==========C==========D==========E==========F=====
  1|Date              Check #     Expense      Deposit      Balance
  2|
  3|Mar  1 87                                                $3,000.00
  4|Mar 13 87              200     $278.50                  $2,721.50
  5|Mar 13 87              201      $55.10                  $2,666.40
  6|Mar 15 87                                    $862.50    $3,528.90
  7|Mar 18 87              202      $73.15                  $3,455.75
  8|Mar 20 87              203      $21.60                  $3,434.15
  9|Mar 30 87              204     $750.00                  $2,684.15
 10|Mar 30 87              205     $238.19                  $2,445.96
 11|Mar 31 87                                    $862.50    $3,308.46
 12|
 13|
 14|
 15|
 16|
 17|
 18|
----------------------------------------------------------------------------
A13

Type entry or use @ commands                                  @-? for Help
```

Figure 2: Using @IF to add and subtract in a ledger spreadsheet

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CIRCLE 225 ON READER SERVICE CARD

```
File: Bonuses                    REVIEW/ADD/CHANGE              Escape: Main Menu
=========A==========B==========C==========D==========E==========F==========G====
  1|Employee        Q1 Sales     Q2 Sales        Bonus
  2|
  3|Jones          $120,000     $150,000        $3,000
  4|Smith          $100,000     $130,000            $0
  5|Davis          $90,000      $140,000        $2,800
  6|
  7|
  8|
  9|
 10|
 11|
 12|
 13|
 14|
 15|
 16|
 17|
 18|
--------------------------------------------------------------------------------
B7

Type entry or use @ commands                                    @-? for Help
```

Figure 3: Using @OR with @IF to calculate employee bonuses

Extending @IF

So far, you've used the @IF function only by itself. The limitation to the function when you use it this way is that you can apply only one logical test at a time. The @AND and @OR functions in Version 2.0 of AppleWorks let you apply two or more logical tests, however. Suppose you're calculating salespeople's bonuses for a quarter. You want to give a bonus equal to 2% of an employee's sales if either of two conditions exists: if the employee's sales for the quarter are $150,000 or more or if the employee's sales for the quarter have improved 50% or more from the previous quarter. You can use the @IF function with the @OR function to test both of these conditions in the same formula.

When you use the @AND or @OR functions with @IF, the structure of the formula is slightly different. You have to specify two or more tests instead of one, like this: @IF(@OR(logical test 1,logical test 2),result if condition true,result if condition false).

The bonus-calculation worksheet appears in figure 3. You've entered the sales totals for quarters 1 and 2 for each employee, and you want AppleWorks to determine whether a bonus is due and then to calculate the amount of the bonus. You use an @IF formula in cells D3, D4, and D5. Here's the formula in cell D3: @IF(@OR(C3>=150000, C3>=(B3*1.5)),(C3*0.2),0.

The formula says: If the value in cell C3 is 150,000 or more, or if the value in C3 is equal to or greater than 150% of the value in cell B3 (indicating a 50% increase in sales from quarter 1 to quarter 2), then multiply the value in cell C3 by 2% (the bonus rate) to calculate the bonus. If neither condition is met, return a zero to indicate that no commission is due.

The @AND function indicates that all the logical tests in the argument must be satisfied, rather than just one of them. In the above example, if you wanted to give bonuses only to people who had both reached $150,000 in sales *and* had increased their sales by 50% from the previous quarter, you would have used the @AND function instead of @OR.

Using @AND or @OR, you can propose as many logical tests as you like in any one formula, as long as you don't exceed the formula length limit of AppleWorks. In versions of the program up through 1.3, the formula length limit is 75 characters; in Version 2.0, the formula length limit is 71 characters.

This basic demonstration of the @IF function should help you understand it well enough to identify your own @IF opportunities as you work. Knowing you have @IF in your bag of tricks, you'll be able to tackle spreadsheet problems more creatively and effectively than ever before. ✚

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CIRCLE 108 ON READER SERVICE CARD

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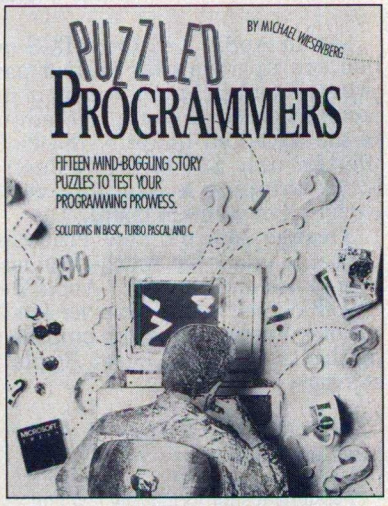

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CIRCLE 175 ON READER SERVICE CARD

HELP FILE
BY STEVE HIGH

QUESTIONS FROM OUR READERS

II PLUS MAIL MERGE

Q. *Is there any way that someone running AppleWorks on a II Plus can have mail merge?*

Richard Headen
Omaha, NE

A. I don't believe that anyone has patched AppleWorks 2.0—the one with Mail Merge—for the II Plus, and I hesitate to suggest a further patch, since most third-party patchers were probably not thinking of the II Plus when they wrote their mail-merge programs.

You may have to rely on the word-processor EK (Enter Keyboard) function, which allows you to do repetitive letters, although you can't leave the room for very long while they're printing. EK is the last choice on the AppleWorks Printer Options menu, and a lot of people don't know it's there. It turns AppleWorks into an old-fashioned MTST-style typewriter, which is an order of magnitude better than a really old-fashioned typewriter.

IN SEARCH OF EASY LEARNING

Q. *I am a health-care professional, not technically oriented. I keep running into half-trained AppleWorks experts who add to my problem. Please direct me to a simpleminded person's guide to AppleWorks—perhaps an audio- or videotape. The* AppleWorks Tutorial *assumes you have nothing better to do but read. Some of us have to work! We have patients and clients, and we are dead when we get home. Help!*

Roland H. Gardner
Detroit, MI

A. I sympathize with your feelings, but the clearest and best introduction to AppleWorks is still to be found in the manuals and diskettes that come with the product when you buy it. You can also get books, newsletters, and other aids, including a videotape from the Q-MAR group in San Diego, but these are most valuable, in my opinion, to users who have already mastered the basic commands and menu structures of AppleWorks.

AppleWorks is easy to use only in contrast to other computer programs. Compared to your toaster, it is hard to use. The program was designed with the liberal-arts graduate in mind, however. A technical education, or even aptitude, is emphatically *not* necessary to use AppleWorks. Time and effort, unfortunately, are.

SEEKING PERFECTION

Q. *I do not normally write letters to the editor, but I'd like to ask you how an 'expert' can make a statement such as "If you purchase or upgrade to a IIGS, you must also upgrade to Version 2.0 [of AppleWorks] if you have an older release, since older versions do not work with the IIGS" (A+, January 1987).*

I hope that you will issue a correction, but I am afraid the damage is done. We need to be able to trust the information printed in your magazine.

Richard Madlener

A. Nobody's perfect—not me, not the author of that statement, possibly not even you. The IIGS can indeed run nearly all older software originally written for the IIe, including earlier versions of AppleWorks.

We strive to be as accurate as possible and appreciate having errors brought to our attention.

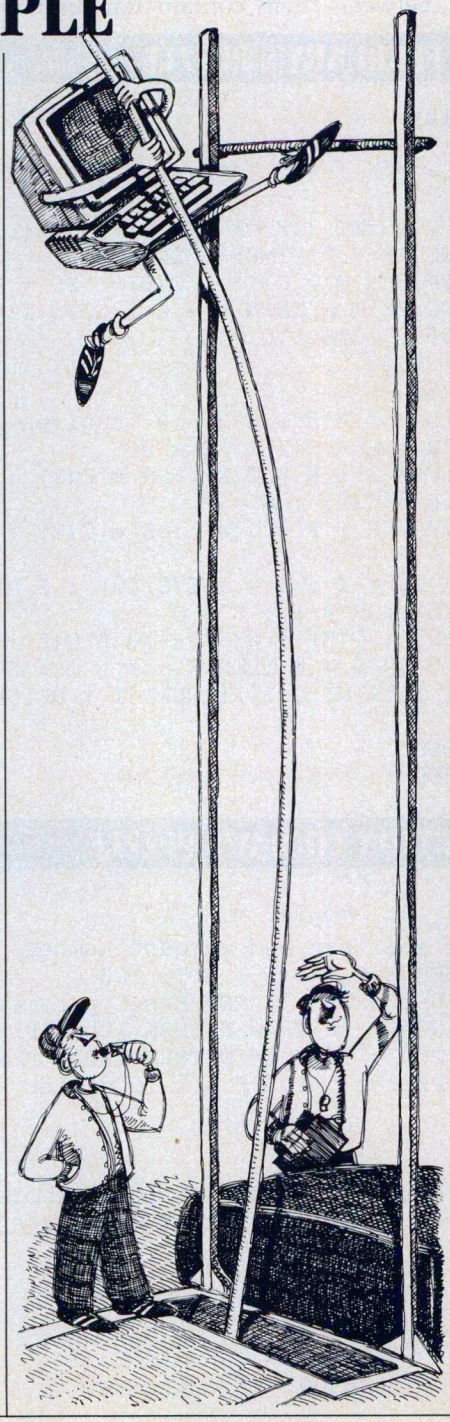
Please send your questions and problems to Help File, A+, 11 Davis Drive, Belmont, CA 94002.

Steve High is a public-relations professional whose clients include Applied Engineering and Bob Lissner, the author of AppleWorks.

BY MICHAEL WIESENBERG

A MATHEMATIC HURDLE FOR YOUR APPLE

A puzzle using geometric progression and cyclic permutations



You need to know a couple of mathematical terms to solve this month's puzzle. A *geometric progression* is a sequence of numbers in which you obtain each term from the previous term by multiplying by a constant factor (called the *ratio*). For example, the series 5, 10, 20, . . . has a ratio of 2, and the series 4, 10, 25, . . . has a ratio of 2.5. *Cyclic permutation* of the digits of a number refers to rearranging the positions of the digits while maintaining the same cyclic order. Thus a three-digit number, *abc*, has three cyclic permutations, *abc*, *bca*, and *cab*. (Note that *acb* and *abc* have a different cyclic order.) Likewise, the three cyclic permutations of the digits of the number 123 are 123, 231, and 312.

So, given all that, find three three-digit numbers in geometric progression such that each is derived from another by cyclic permutation of the digits. There are several of what mathematicians call *trivial solutions*—for example, 111, 111, and 111. They are the same when cycled, and their ratio is equal to 1. Your program should find both the trivial and nontrivial solutions.

Send a complete program. Be sure to include output and running time.

If you send a disk, please also enclose hard copy. Your program must be short; elegant; and, if not self-documenting, accompanied by a good, concise, explication. The best solution wins a one-year subscription (or extension) to *A+* magazine and a Certificate of Excellence in Programming and will be published here.

Please send all entries, which must be received by August 13, 1987, to Computer Calisthenics, Box 2329, Stanford, CA 94305. Please send entries by *regular* mail only. The author does not receive in time any mail for which he must sign. All entries become the property of the author. The winner will be selected by the author, whose decision will be final. The winning program will be announced in the November 1987 issue of *A+*.

Answer to May's Puzzle

We had two puzzles in the May issue. One was a holdover from February, for which I awarded no prize because nobody solved it. I gave several hints and then reissued the challenge. I'm going to give honorable mentions to all those who then solved the problem but not print any of their solutions, because all were either written in a language that didn't run on an Apple II or were too long to fit here. Dr. Walter Bell, of Pleasanton, California, from whom we'll hear again in a moment, had the best solution. His executed the fastest also—in about three and a half minutes. Unfortunately, he wrote it in Microsoft BASIC for the Macintosh, which I wasn't conveniently able to translate into AppleSoft, and it was too long.

These are the other honorables: Garrison Flemings, of Montgomery, Alabama; Christian Foisy, of Laval, Quebec; Dr. Fredie Gargano,

ILLUSTRATION BY PETER BONO

of Miami, Florida; Bruce Hoelter, of Bloomsbury, New Jersey; John Nolton, of Van Nuys, California; Casper Otten, of Santa Clara, California; Edwin Smith, of Olala, Florida; and R. F. Wheeling, of Naples, Florida.

Figure 1 contains the programmatic solution for which I gave hints in the May issue, followed by the answer.

The other May challenge asked what number had in the digits of its square and cube all the digits 0 through 9, once each. A few people thought I meant that the square and the cube would *each* contain all the digits and correctly concluded that that was impossible. What I meant was that the digits would be spread among the square and the cube.

The shortest program came from Ronald Dixon, of Irvine, California, who did it all in one statement (five 79-character lines).

The best and fastest-executing program came from Dr. Walter Bell, of Pleasanton, California. Without his REM statements, the program runs to completion in five seconds. The program tests only those numbers from 47 to 99 inclusive, because anything less does not produce a square and cube that between them contain ten digits, and anything greater produces a square and cube that between them contain more than ten digits. I added a small refinement that halves the running time. The number to be squared and cubed cannot have in the ones position 0, 1, 5, or 6, because then both the square and the cube would have a digit in common. Statement 21 causes all such numbers to be skipped.

Figure 2 is the program, followed by its results. ✚

Michael Wiesenberg is the author of The Puzzled Programmers, *a book of new computer puzzles published by Microsoft Press.*

FIGURE 1: THE SOLUTION TO FEBRUARY'S PUZZLE

```
10 DIM C(999), NC(999), Q(14)
20 K0 = 2 ^ (1/3)
30 FOR I = 1 TO 999 : C(I) = I * I * I : NC(I) = 9 * C(I) : NEXT I
40 Y = -1 : D = 2
50 Y = Y + D : D = 3 - D : V = INT ((K0 * Y - Y) / 3) + 1 : T = 3 * V
60 IF Y + T > 999 THEN PRINT A$;";";TIME$ : END
70 FOR X = Y + T TO 999 STEP 3 : M = C(X) - C(Y) : Z0 = V
80 FOR Z = Z0 TO 999 : IF NC(Z) < M THEN V = Z : GOTO 110
90 IF NC(Z) > M THEN Z = 999 : GOTO 110
100 GOSUB 200 : V = Z : Z = 999
110 NEXT Z : NEXT X : GOTO 50
200 PRINT : PRINT "A solution of A^3 + B^3 = 9 is given by"
210 PRINT "A = ";: V = X : R = M - C(Y) : S = 0
215 GOSUB 300 : PRINT "/";:V = Z : R = C(X) : S = C(Y) : GOSUB 300 : PRINT
220 PRINT "B = ";: V = Y : R = C(X) : S = M
225 GOSUB 300 : PRINT "/";:V = Z : R = C(X) : S = C(Y) : GOSUB 300 : PRINT
300 K = 0 : Q(K) = 0
310 I = INT(R/10) : R = R - 10 * I : J = INT(S/10) : S = S - 10 * J
320 Q(K) = Q(K) + V * (R + S) : R = I : S = J
325 Q(K + 1) = INT(Q(K) / 10) : Q(K) = Q(K) - 10 * Q(K + 1)
330 IF Q(K + 1) > 0 OR R > 0 OR S > 0 THEN K = K + 1 : GOTO 310
340 FOR I = K TO 0 STEP - 1 : PRINT Q(I);: NEXT I : RETURN

A = 676702467503/348671682660
B = 415280564497/348671682660
```

FIGURE 2: THE WINNING SOLUTION TO MAY'S PUZZLE

```
10 PRINT "NUMBER", "SQUARE", "   CUBE"
20 FOR X=47 TO 99 : REM The smallest and largest numbers possibles.
21 IF INT(X / 5) = X / 5 THEN X = X + 1 : GOTO 100
30 FOR K = 0 TO 9 : A(K) = 0 : NEXT K : REM Reset parameters.
40 N = 4 : M = X^2 : GOSUB 200 : IF I <= N THEN 100 : REM 4-digit number.
50 N = 6 : M = X^3 : GOSUB 200 : IF I <= N THEN 100 : REM 6-digit number.
60 PRINT X, X^2, X^3 : REM Prints only if all 10 digits are different.
100 NEXT X
110 END
200 FOR I = 1 TO N
210 M1 = INT(M/10) : C = M - 10 * M1 : M = M1 : REM Isolate each digit.
220 IF A(C) = 0 THEN A(C) = 1 : GOTO 250 : REM Eliminate duplicates.
230 RETURN
250 NEXT I
260 RETURN

NUMBER          SQUARE          CUBE
 69              4761           328509
```

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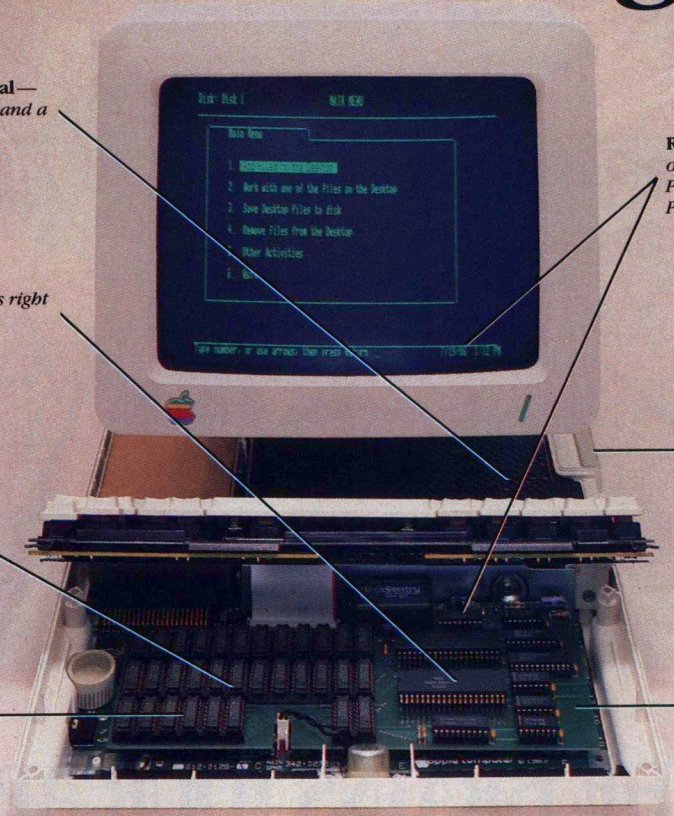

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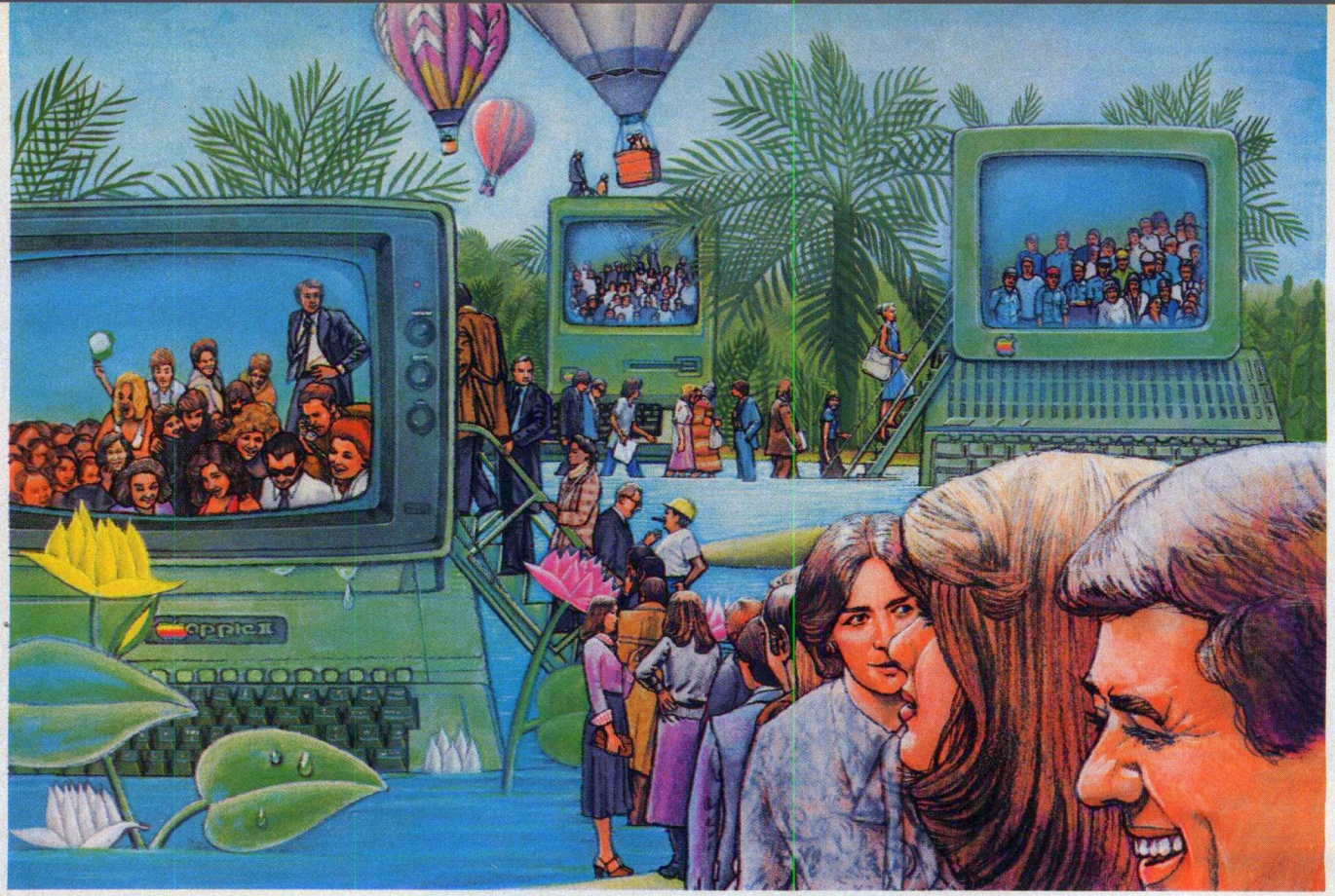

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CIRCLE 271 ON READER SERVICE CARD

BY MICHAEL FISCHER

TELECOMMUNICATIONS TRENDS IN ACTION

Freeware for the II series, IIGS developments, and cutting your phone bill

This year's telecommunications issue (*A+*, April 1987) predicted several trends in communications for the Apple II family, including increasing support of the Apple IIGS and use of the Binary II protocol in transferring files.

FreetermGS, a program that has recently become available, represents both of these trends. Indeed, it takes GS support one step further than merely permitting use of the built-in serial port on that machine. It works only on the Apple IIGS and runs under ProDOS 16, incorporating a super-high-resolution graphics interface and mouse operation.

FreetermGS requires the Apple IIGS serial port and an external, Hayes-compatible modem. It permits, optionally, automatic use of the Binary II protocol for uploading and downloading. But the best part of the news is the price: free. Well, FreetermGS is not actually free; you must download it from CompuServe's MAUG section and thus pay for connect time while you are downloading. It takes about ten minutes at 1200 bps to download the program, which works out to about $2.10.

Bill Bond, the man behind Freeterm on the Macintosh, also wrote this program. It is copyrighted but may be freely distributed as long as the copyright notice and the advertisement for Dreams of the Phoenix (the publisher of Freeterm) remains with it. Dreams of the Phoenix has released several good utility programs for the Macintosh. According to its notice on FreetermGS, it is planning to move into the Apple IIGS market as well.

FreetermGS makes full use of the Apple IIGS interface, with pull-down menus, dialog boxes, and text created by QuickDraw graphics commands. Although the program proves that it's possible to run telecommunications programs that use the IIGS graphics interface, the early-release version of the program does have a noticeable flicker when you're scrolling text. Since I like the Apple IIGS interface, however, this program could become a favorite, if only it had a review buffer.

Desk Accessories

While we're on the subject of MAUG and the IIGS: That service is sponsoring a contest involving desk accessories for the IIGS, called the DAcathlon. The MAUG data library now contains quite a few entries—more than ten public-domain classic desk accessories (CDAs) and several new desk accessories (NDAs) for the IIGS.

Classic desk accessories are those that you can access on the IIGS from any ProDOS 8 or ProDOS 16 program that does not disable interrupts.

A new desk accessory requires you to run a program under ProDOS 16 and the IIGS super-high-resolution graphics interface.

The desk accessories, available in Data Library 6, range from items such as a notepad, calendar, and clock, to programmers' utilities for displaying memory usage or the version numbers of IIGS tool sets in use.

By the time this column appears, round 1 of the DAcathlon will be over, and round 2, focusing exclusively on new desk accessories, will have begun.

ILLUSTRATION BY DOUG PAULIN

Apple Conference Terminal

Now seems to be the time for freeware telecommunications programs for the Apple II family. Apple Conference Terminal (ACT for short), for instance, has become available in what is called a continually evolving form on the GEnie service in the Protree Roundtable. This roundtable focuses on Apple telecommunications and emphasizes Protree bulletin-board products such as Protree Elite (multiuser BBS program), Protree Prime (commercial BBS program), and Alfa Easy (public-domain BBS program).

ACT is a basic telecommunications programs for individuals who want to communicate with a remote computer, most commonly a national service. I recently saw an early version of the program that worked but lacked several planned features. By the time this column appears, Bob Garth, the program's author, intends to have added them.

If you have ever taken part in a teleconference via computer or used the CB simulators on any of the on-line telecommunications

MAUG is sponsoring a contest involving desk accessories for the IIGS.

services, you will probably want to download ACT just for its CB mode. This mode features a split screen with incoming messages on one side and outgoing messages on the other. This separation is handy because it lets you avoid the problem—with normal CB or computer conferencing—of everything appearing on one screen. If you're typing "I agree" while someone else is sending a message consisting of the first line of the Gettysburg Address, your screen tends to look like this: "FouIr sc ore and seaven yeagrs ago, ourr fathers breought forth on thise continent . . ." As you can see, your outgoing message becomes completely lost, and the incoming message gets garbled.

ACT also allows Xmodem uploads and downloads and will be enhanced to include both Binary II and whole-disk transfers. It will also have a copy buffer, terminal emulation, and graphics. The program presently requires an Apple Super Serial Card in slot 2 or a card that emulates that interface. ACT will work with the IIGS serial port in a future release.

As with FreetermGS, the cost of ACT is merely that of the download time. It takes about five minutes at 1200 bps to download the program from GEnie, which costs 42 cents.

The Chicken or the Egg

Trying to download either of these two free telecommunications programs presents a problem similar to that of the chicken and the egg. In order to download a program, you need to have a telecommunications program. Of course, many of you will already be using a communications package and cruising the on-line services for the newest freeware offerings, but some of you may want to download a program that will be your first telecommunications program.

Fortunately there are several ways out of this dilemma:

- Your modem may come with a ru-

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CIRCLE 167 ON READER SERVICE CARD

Now seems to be the time for freeware telecommunications programs for the Apple II family.

dimentary terminal program that at least permits you to connect to a service and download files. In addition, many modems come with special offers from some services reducing sign-up charges or giving you a limited amount of free time when you sign up.

If you use this method to obtain FreetermGS, you will also need to download the Binary II download program, which permits you to convert a downloaded program from Binary II to ProDOS format. Without this conversion, you cannot use FreetermGS. The terminal program must also permit XModem downloading.

You can download ACT with any program that has text-file downloading (even through use of a capture buffer) or with XModem downloading.

- You can persuade a friend with a telecommunications program to download the program for you.
- A friend or users' group can give you a copy. Free distribution of program copies is permissible with FreetermGS but not ACT.

Neither of these two telecommunications programs are public-domain programs. Both are copyrighted, and you can copy them or download them only in accordance with the conditions the authors set forth. In the case of FreetermGS, as I've mentioned, you must include a copy of the Dreams of the Phoenix copyright notice and advertisement with the program. In the case of ACT, you must not give a copy of the program to anyone; all users must download the program themselves. Unlike shareware, though, neither of these programs imply that you should pay the author if you like the software.

PC Pursuit

Scattered throughout the country are many different bulletin-board systems, commonly known as BBSs. Some of these are Apple II-specific or have a special Apple II area on them; others have special

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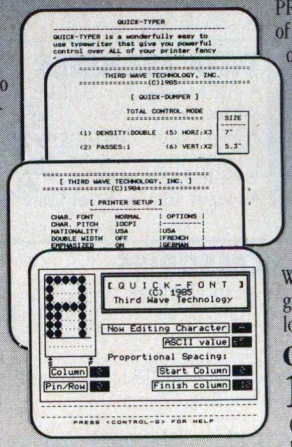

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CIRCLE 144 ON READER SERVICE CARD

topics such as genealogy, science fiction, or health. Many of them are free except for the cost of the telephone call. You can also find some free-access databases that are run by governmental or other organizations.

Many local computer newspapers contain a list of local BBSs. From some of these boards, you can get a list of other systems throughout the country. Also handy is a book called the *Computer Phone Book Directory of Online Systems*. From time to time, I plan to feature some of these bulletin boards in this column.

Of course, the cost of the telephone call is no small matter. Even the cheapest long-distance rates for a coast-to-coast call can run more than 15 cents a minute. One way to avoid some of this cost is to buy your computer phone service at a monthly flat rate by means of PC Pursuit from Telenet.

Many telecommunicators already know Telenet as a packet-switching network through which they can connect to different national services such as The Source or Delphi. You access PC Pursuit in the same way, a call to your nearest Telenet node—a local call for many people.

Once you are on PC Pursuit, you can call any computer within the local dialing area of 25 different Telenet cities (see accompanying list). Telenet recently added 11 cities and plans to add 100 more by the end of 1987. Presently you are restricted to 300 or 1200 bps, although 2400 bps will gradually become available throughout the year. PC Pursuit costs $25 a month after a $25 sign-up charge. Additional charges apply for calls between 7 A.M. and 6 P.M. on nonholiday weekdays.

The main problem with the use of PC Pursuit is determining whether a telephone number within a particular area code is within the local dialing area of the Telenet node in that city. PC Pursuit uses the message Busy to signify both a true busy signal or a telephone call outside the local dialing area, so you may have a hard time determining which kind of "busy" signal you have.

In the next column, I'll take a look at the shareware concept in

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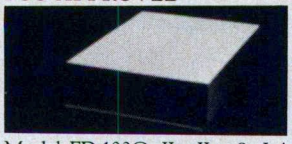

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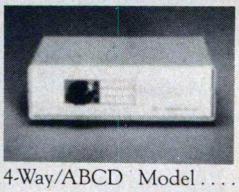

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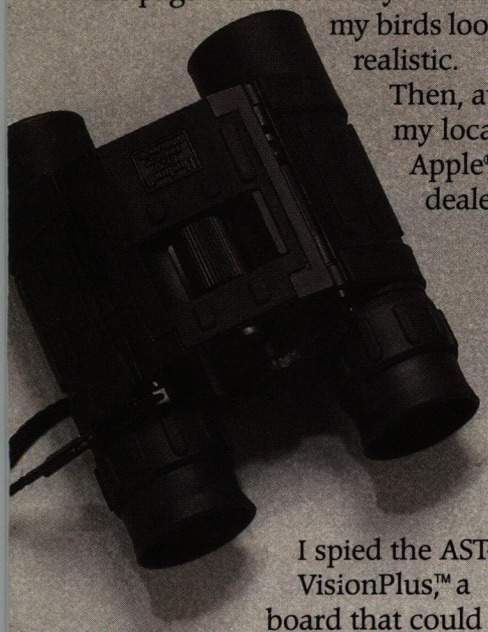
"Without realistic images, my newsletter was an endangered species."



The copy was vivid, but the images weren't exactly flying off the page. I needed a way to make my birds look realistic.

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Another idea burst into my head. I popped my video cassette "Mating Habits of the Paradise Whidah" into the VCR and spent the better part of the night in a rapturous flurry, capturing images for Christmas cards, T-shirts, flyers, personal stationery and invitations.

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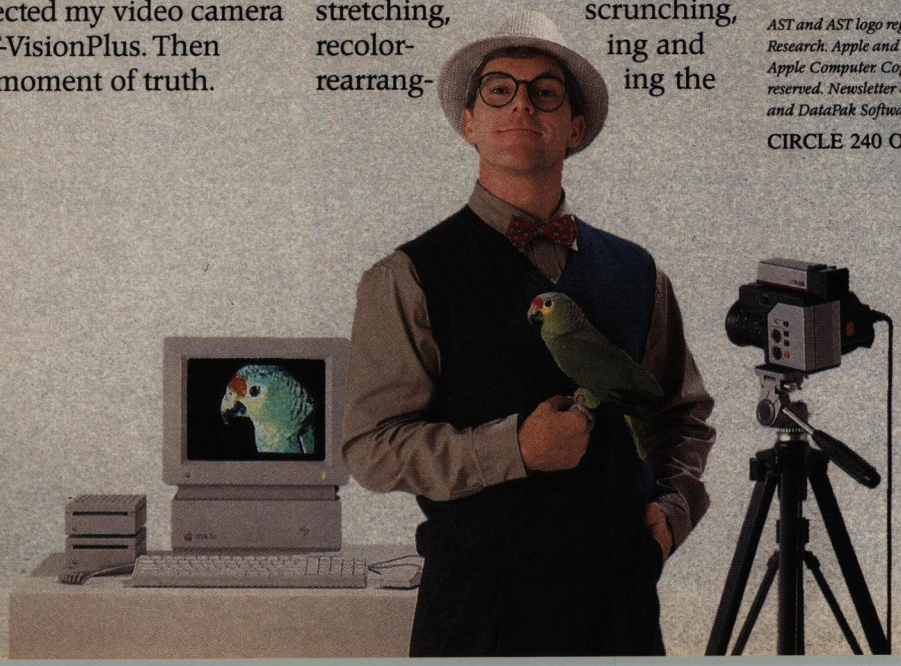

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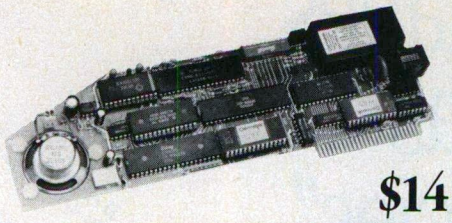

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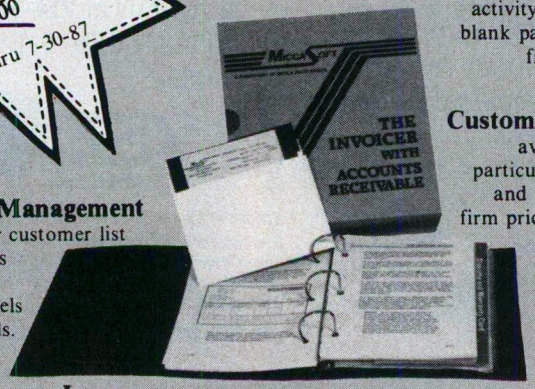

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Michael Fischer is the author of The Apple IIGS Technical Reference *as well as* 65816/65802 Assembly Language Programming *(both from Osborne/McGraw-Hill) and coauthor of the* Apple II Expansion Guide *(Tab Books). He is an attorney, author, columnist, and programmer. He has owned and used Apple computers for nearly ten years.*

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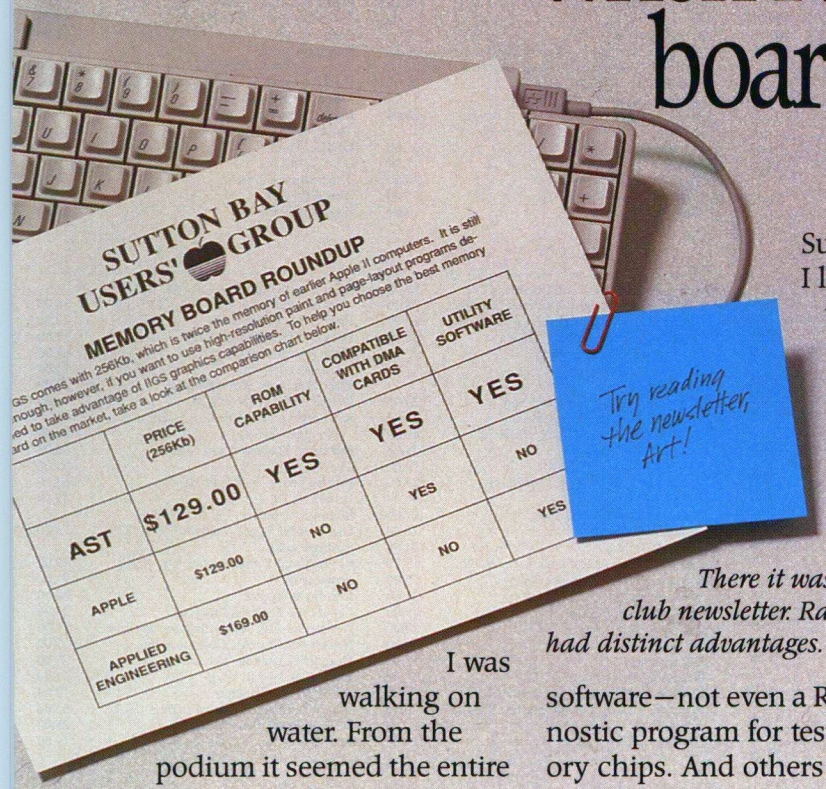
"Everyone gasped when I said all memory boards were alike."



There it was in the club newsletter. RamStakPlus had distinct advantages.

I was walking on water. From the podium it seemed the entire user group was hanging on to my every word. And then out of nowhere, this guy from the back row asks, "Which memory card would you recommend for my IIGS™?"

The rest is history. And it looks like I am too. Who would have thought the differences in memory boards made a difference?

CIRCLE 245 ON READER SERVICE CARD

Sure enough, I learned that some memory cards are price competitive, but include no software—not even a RAM diagnostic program for testing memory chips. And others are too expensive to even consider.

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Well, you live and learn. And if you're lucky, you get even. I'm brushing up on my facts for tonight's meeting. You'll never guess who's speaking. The guy from the back row.

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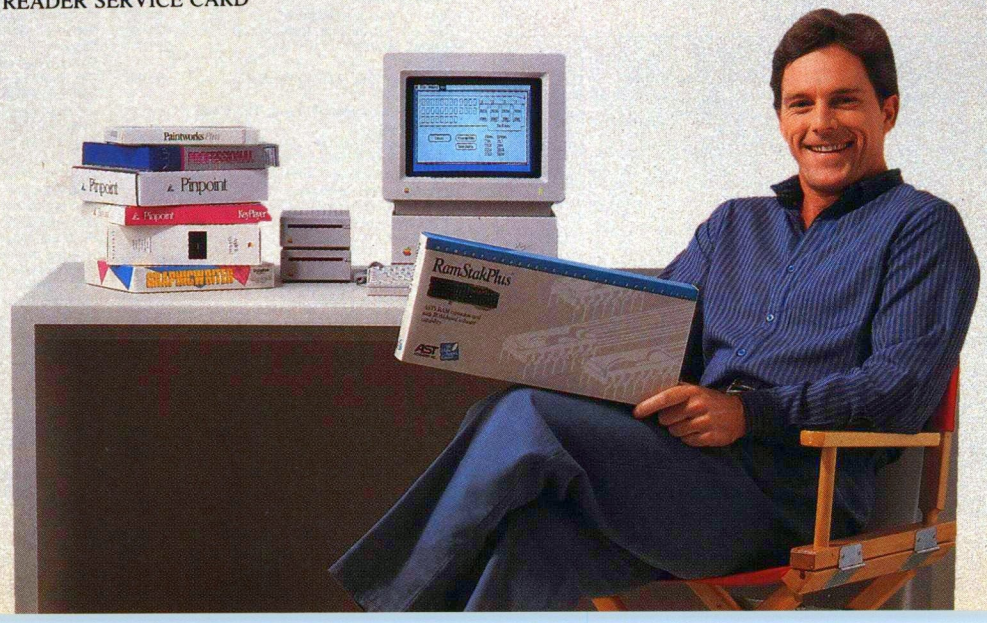

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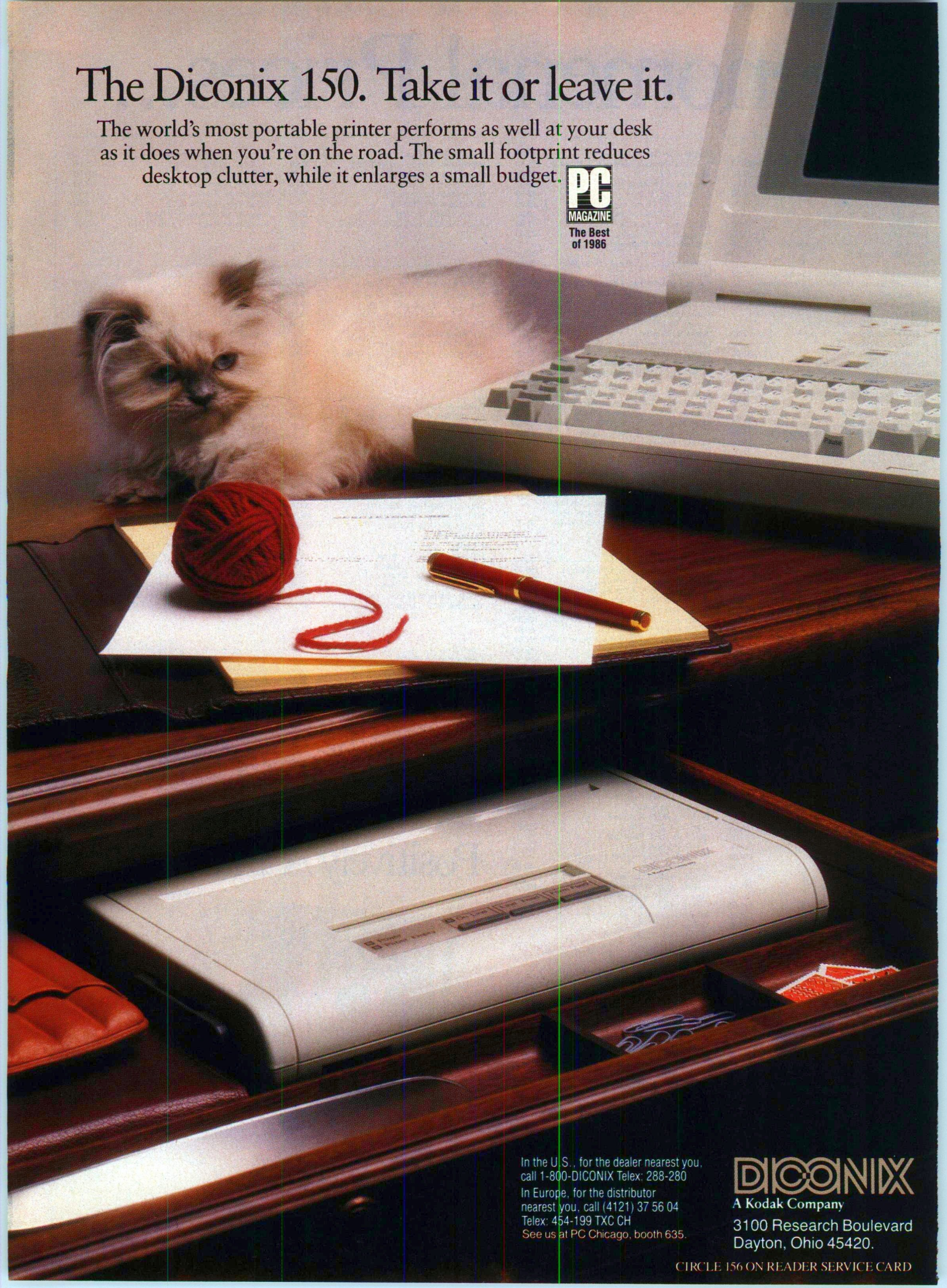

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BY DAVID D. THORNBURG

PROLOG AND EDUCATIONAL COMPUTING

A look at the possibilities of a language that can draw inferences

Educational-computing conferences in the United States always contain sessions on Logo. In Europe, too, Logo has a lot of support, but a language called Prolog has become increasingly popular.

My first encounter with Prolog came a few years ago when we were starting to hear a lot about the Japanese Fifth Generation Computer project. Of all the extremely powerful symbol-manipulation languages from which they could choose, Japan settled on Prolog, a language that was not receiving much support in the United States at that time.

What fascinates me about this language is not only that it has the power to help create expert systems and to do other complex artificial-intelligence tasks, but also that much of it can be as accessible to children as Logo is. Furthermore, Prolog allows children to express ideas to the computer that are hard to express in any other computer language with which I'm familiar.

I feel that Prolog has so much to offer as an educational-computing language that I plan to devote two columns to this topic.

Logo is a derivative of the U.S.-invented AI language Lisp, whose syntax was designed to make it usable by children. Lisp and Logo's ability to do symbolic (as opposed to just numerical) computation provides them with great strength. The original Logo experiments showed that high-school students could easily write programs that generated poetry, analyzed sentences, and performed other symbol-manipulation tasks that were much harder to perform with other languages.

Logo's Turtle Graphics

When Logo acquired its turtle-graphics capability, it became accessible to students in the primary grades. Unfortunately, Logo's turtle graphics became the tail that wagged the dog. Because turtle graphics was a rich domain that could be explored with far greater ease than the rest of the language, many teachers and students never took the time to learn anything else.

A Step Further

What if there were a language that allowed people to work with knowledge of many kinds as easily as they could work in Logo's comparatively limited domain of geometrical pictures? This new language could find uses in social studies, mathematics, English, philosophy, and geography—anywhere that ideas could be expressed and manipulated. Clearly, such a language would have great benefits for people interested in educational computing.

For a variety of reasons, I saw this potential lurking within Prolog. Several years ago, I tried to find others who shared this opinion. With few exceptions, all the work involving Prolog and children was taking place outside the U.S. Unfortunately, Prolog development still appears to be mainly a Japanese and European activity. Nonetheless, let's take a look at what we're missing. The fact is: Prolog has tremendous potential as the basis of a computing environment for children.

The Essence of Style

The very essence of the Prolog language is a programming style

ILLUSTRATION BY ROBERT KOPECKY

that places it in sharp contrast to that of other computer languages. Instead of creating programs that prescribe how a task is to be performed, Prolog programs (generally) describe what the program is to do and leave the messy details to the computer.

Be honest now—isn't that how you thought computers were supposed to work?

Most Prolog books spend time talking about logic programming and first-order predicate calculus. These terms please the academics and are useful for programmers who like to "lift the hood" on a language, but they aren't necessary for beginning Prolog users.

All you need, in brief, is a subject domain to explore and the ability to express facts and rules about this domain in a form that Prolog can work with. Once you have communicated this information to the computer, you can ask questions about your domain, and the computer will answer them.

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A Simple Prolog Program

A first program in BASIC usually prints the user's name on the screen 100 times. A first program in Logo usually draws a simple shape such as a square. In the spirit of simplicity, our first Prolog program will create a database on parents and then, through a built-in inferencing mechanism, let you identify people's ancestors.

Prolog has several available syntaxes, and you can create new ones. I have chosen the Edinburgh syntax because I wrote this article while I was at an educational-computing conference in Scotland and because it is most likely the most popular syntax at this time. This syntax is probably not the best for young users—I'll explain why in the next column.

The following is the sample Prolog program:

```
parent(bob,dave).
parent(cleo,dave).
parent(bob,kathy).
parent(cleo,kathy).
parent(evelyn,bob).
parent(devoe,bob).
parent(lillie,cleo).

ancestor(X,Y) :-
   parent(X,Y).

ancestor(X,Y) :-
   parent(X,Z),
   ancestor(Z,Y).
```

The first collection of statements expresses some "facts" for the database about people's parents. For example, the first statement says, "Bob is the parent of Dave." Constants in Prolog (called atoms) start with lowercase letters, hence dave. From this simple collection, you can probably create a collection of information in Prolog about your own family.

The statements concerning the ancestor relationship are examples of Prolog rules. The symbol :- corresponds to *if*, so the first rule states, "X is the ancestor of Y if X is the parent of Y."

Although this statement is true, it is an incomplete definition of ancestors. The second rule simply states that the ancestors of your parents are your ancestors as well. The comma after parent(X,Z) stands for *and*. This second rule has the following reading: "X is an ancestor of Y if X is a parent of Z and Z is

an ancestor of Y." This perfectly logical definition uses recursion (by defining itself in terms of ancestor) to ensure that all ancestors will be found in the search, no matter how many generations the program represents. The use of uppercase letters in the rule definitions indicates that these terms are variables whose values will be set and reset automatically by Prolog as it searches for answers to your questions.

Now run your program to see what you get. If you wanted to know if Bob was an ancestor of Dave, you would type

```
?- ancestor(bob,dave).
```

and the computer would print

```
Yes.
```

This result was calculated by use of the first ancestor rule. Next you could ask for all of Kathy's ancestors by typing

```
?- ancestor(X,kathy).
```

The computer would use combinations of both ancestor rules to generate the following answers:

```
X = bob
X = cleo
X = evelyn
X = devoe
X = lillie
```

OK, I admit that you don't need a program to perform this task. I even admit that such a task could probably be handled by a sophisticated relational database, but that misses the point. We don't need programs to print a name 100 times or to draw a square either. The only purpose of this program is to give a little taste of what a Prolog program looks like. I think that a programming language that can make inferences is pretty classy, especially when this same language, with a bit more effort, can be used to create a short program (less than 20 lines) that can solve problems such as this one:

Assign unique digits to each different letter in the names below so that the sum is correct.

```
  DONALD
+ GERALD
  ROBERT
```

This example provides a good illustration of what sorts of problems you can tackle with Prolog's ability to do symbolic computation. Although I don't have space to delve further into this example, you can find a complete discussion of it in Ivan Bratko's excellent book *Prolog, Programming for Artificial Intelligence* (Addision-Wesley, 1986).

Suppose that Prolog's syntax were simplified, how could it function in the classroom? If we start with the simple database metaphor (a simplistic view), it is easy to envision Prolog's use in history, geography, biology, or other fields in which a large body of knowledge can be interpreted with the aid of hypotheses (rules) and through the formulation of proper questions. The direct connection of this language to core curriculum areas is amazing.

Next month we'll take a closer look at a sample Prolog lesson that goes beyond the capabilities of a simple database. We'll also consider Prolog on the Apple II, in case you want to start tinkering with this language yourself. ✚

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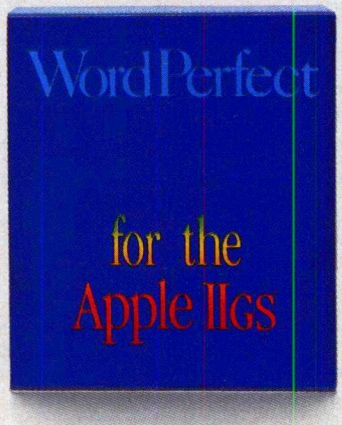

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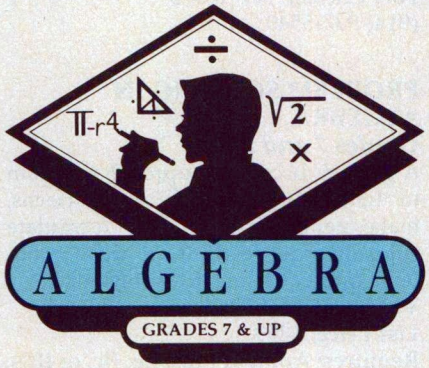

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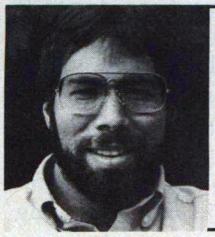

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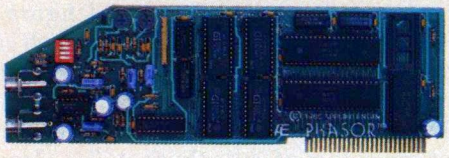

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BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

OFFERING YOU SOME APPLE GRAPHICS TIPS

A selection of handy graphics hints for computer artists

It isn't easy to produce high-quality artwork on an Apple II computer. The resolution is relatively low; the palette is limited, and colors conflict; lines are jagged, and pixels can't be split in half. Yet, as evidenced by the images you've seen in our Graphics Gallery, the Apple II can indeed be a powerful artists' tool. Read on: We've got a bag full of tips for you.

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So how can you superimpose that green palm tree on the orange sunset? Simple. Hi res has two color sets: color set 1 consists of green, violet, white 1, and black 1. Color set 2 comprises blue, orange, white 2, and black 2. Since problems occur only when the colors from one set meet the colors of the other set, you can bridge the gap by using white or black outlines.

Use white 1 or black 1 to outline the green part of the tree and white 2 or black 2 to outline the orange in the sky. When the two whites, or the two blacks, meet and conflict with each other, it won't be discernible (see figure 1).

Try Dithering

Since colors don't conflict when you place them above or below each other (on alternating scan lines), another solution is to substitute mixed, or dithered, colors for solid ones. Some paint programs allow you to mix your own colors. Create a "dark orange" by drawing alternating horizontal stripes of orange and black 1. Mix a "dark green" by drawing alternating stripes of green and black 2. As long as the black 1 stripe (from your dark orange) is on the same scan line as the green stripe (from your dark green), you can freely use the paint mixtures next to each other anywhere on the screen (see figure 2). Some paint programs, such as The Complete Graphics System, provide a palette of dithered mixes that work this way.

Although it isn't easy to produce high-quality artwork on an Apple II, your computer can be a powerful artists' tool.

Jaggies

Jaggies are characteristic of computer graphics. Lines that aren't horizontal or vertical are jagged—how jagged depends on the computer's resolution.

You can lessen the jaggedness of a line, or the edge of a shape, by applying a traditional technique: Shade the line, or edge, with a color of the same hue but of different brightness. If, for example, your line is white on a black background, add gray pixels along either side of the line. On the Apple IIGS, in the super-hi-res mode, you can make several shades of a color to camouflage the jaggies. In double hi res, you have fewer shades of each color to work with, but it can be done (see figure 3).

In the standard hi-res mode, with its limited palette of eight colors, there's not much you can do about this problem except to try to avoid lines that are not horizontal, vertical, or at a 45° angle. If you must use such lines, you may be able to "pixel split" to smooth them. Don't take the terminology literally. Read on.

Pixel Splitting

Sometimes you need a clean appearance that only more pixels can provide. How do you get more pixels? It depends on which Apple II graphics mode you're using.

First, we'll look at standard hi res, which is supposed to have a 280-pixel horizontal resolution. Unfortunately, that number applies only to white. Since the computer creates color by displaying alternate pixels, the true color resolution is half of 280, or 140. Interestingly, because of the way the Apple uses video, color set 1's pixels shift slightly to the left on the screen, whereas the pixels in color set 2 shift slightly to the right (see figure 4). You can use this information to your advantage.

Figure 2: To avoid color problems, use dithered colors instead of solid ones. The boxed area shows the mixtures as seen in the magnified mode.

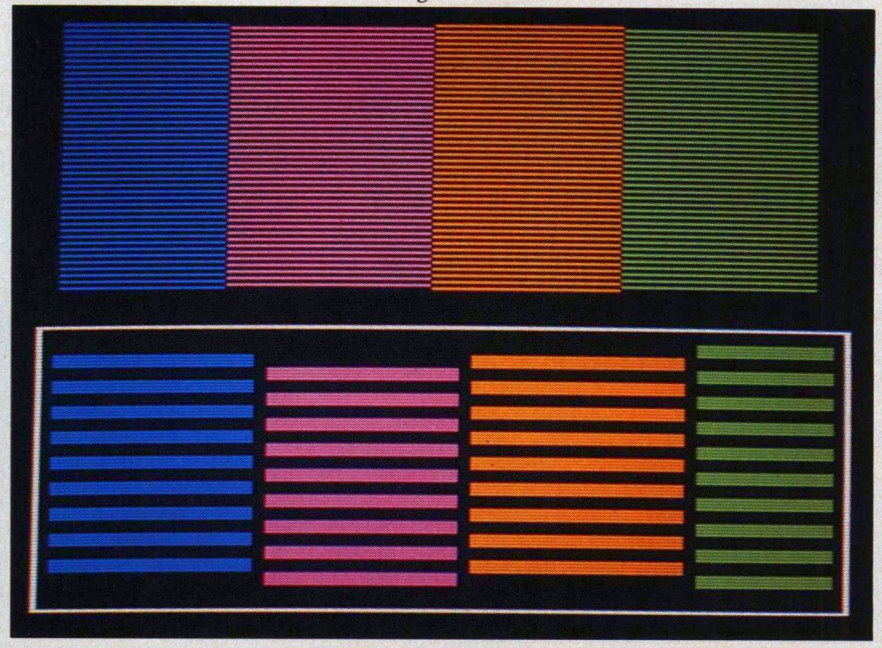
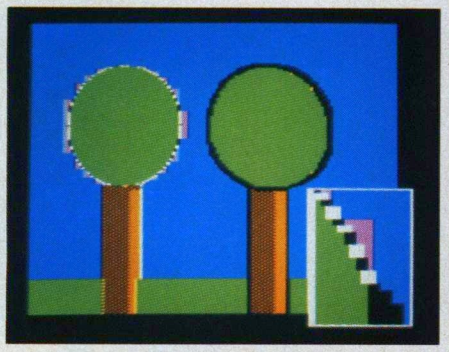


Figure 1: In the standard hi-res mode, problems can occur when the colors from one set meet the colors of the other set. Bridge the gap by using white or black outlines. The section within the white box, a magnification of part of the tree, shows the color conflict.



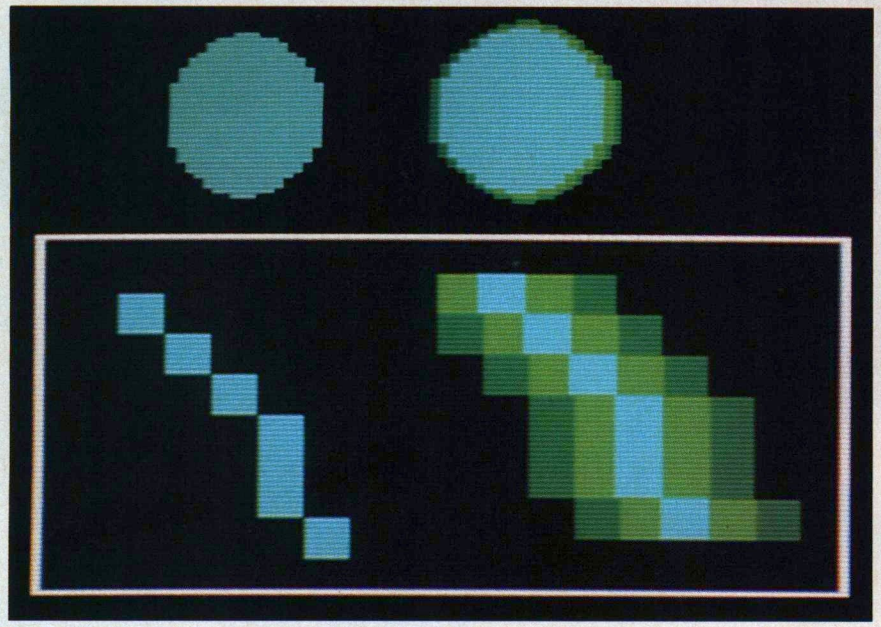


Figure 3: You can lessen the jagged appearance of a line or the edge of a shape by using a color along the edges that is of the same hue but of different brightness.

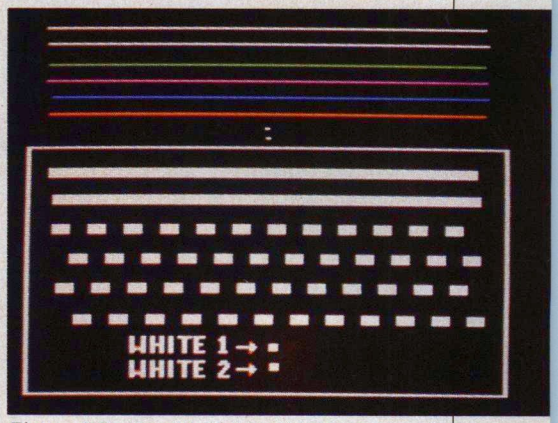


Figure 4: In standard hi res, the 280 horizontal resolution applies only to white. The computer creates color by displaying alternate pixels, so the color resolution is actually 140. The magnified area in the white box shows that the white 1 and white 2 pixels are slightly shifted.

If your image has a white border on a black background, or the opposite, you can create an illusion of higher resolution by using the other white or black. That is, if your border is in white 1, careful application of white 2 along the boundary, or black 2 in the area next to the boundary, will smooth the edges of the border. If your image will be viewed in monochrome, and it doesn't matter what colors go where, you can vertically alternate color set 1 and color set 2 to achieve true 280-pixel horizontal resolution.

In double hi res, the location of the bits that make up each pixel also affects the pixel's position on the screen, albeit slightly—which explains why the two grays, which look identical, may have different effects on the appearance of an image. By using a "monochrome" magnification mode such as the one in Dazzle Draw when you use the Goodies menu to turn off color, you can fine-tune all the edges in your image. As in standard hi res, if your image is to be viewed in monochrome, you can have complete freedom and achieve true 560-dot horizontal resolution.

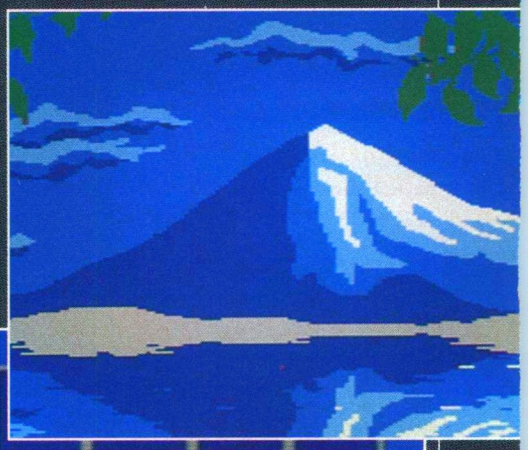
On the Apple IIGS, in the 320 su-

SPEAKING OF GRAPHICS GALLERY

With these impressive double-hi-res images, our readers prove what we've been saying all along: With all of its limitations, the Apple II is still a viable artists' tool. All three of this month's artists used Dazzle Draw; Mario Dimen and Carolyn Craig both used a mouse with a IIc, and Janis Gunnell used a mouse and her IIe.

WINTER and FUJI, **MARIO L. DIMEN,** *Montebello, CA*

A+ invites readers to submit artwork created with the Apple II to the "Speaking of Graphics Gallery." We will pay $25 for pictures selected for publication. Submissions must be on a diskette and include a written description of the hardware and software used. When submitting pictures made with Dazzle Draw, please format your disk with a slide-show option so we can boot the disk and look at the pictures. Send your artwork to *A+* magazine, 11 Davis Drive, Belmont, CA 94002, Attn. Graphics Gallery. Submissions cannot be returned.



CAT WITH FLOWERS and LIGHTHOUSE, **JANIS GUNNELL,** *Kenosha, WI*
(Inset) FOURTH OF JULY and EAGLE, **CAROLYN CRAIG,** *Shelbyville, IN*

per-hi-res mode, you have less flexibility because the pixels aren't organized into color sets. Their color, or bit makeup, doesn't affect their screen location. In the 640 mode, however, if you're using a dithered color set such as those that 8/16 Paint and Deluxe Paint II provide, careful palette manipulation may enable you to achieve smoother graphics. We've only seen demonstrations of these programs operating in the 640 mode, so we can't give you a definitive tip here.

For professional-quality work, programs pay attention to detail. Don't hesitate to use different graphics programs to create one graphic—especially when working in standard hi res, for which you can find dozens of paint programs. For lettering, use only a program that gives clean proportional fonts. (We use Fontrix and Font Mechanic). When you need circles, use a program that makes circles, not ovals. (We prefer Blazing Paddles).

Finally, before you declare a graphic complete, go over it with a "magnifying glass." Bring the graphic into a program that has a good zoom mode and clean up those errant pixels! If you put white 1 next to blue and a small area of the blue has flipped to violet, clean it up. If one pixel seems to have come out of nowhere on an otherwise smooth area of black, get rid of it. When creating white vertical lines, make the lines double, or they'll be flecked with color.

We save often! The minute we begin to like the image we're creating, we stop and save it to disk. Programs crash, plugs loosen from their sockets, and electrical surges are unpredictable. Passers-by, and keyboard-strolling cats, press Reset keys.

We make backups! We keep at least two copies of each of our graphics and keep each copy on a different disk. Disks can get lost or damaged.

We use two monitors, a monochrome next to a color one. Why? First, when you view your work on a color monitor (especially a composite monitor), you can't see individual pixels. Fine-tuning your graphics is almost impossible if you can't see and manipulate every dot on the screen. Also, creating graphics means spending hours looking closely at a display, and a monochrome monitor is considerably easier on the eyes. We do most of our work looking at the monochrome display, and we check our color choices and combinations with an occasional glance at the color monitor.

Before we begin to work, we use a color-bar program to make sure the color monitor is adjusted correctly. Have you ever spent hours working on a graphic only to find, when you showed it to someone on a different monitor, that where you thought you used violets there were greens? It might be fun to turn the knobs on your monitor and get true red or yellow on the Apple hi-res screen, but remember that when others view your work they'll be seeing Apple's own blue, violet, orange, and green.

RGB display is fine for the IIGS super-hi-res modes, but it does no justice to images created in the other graphics modes. When we use an RGB monitor to create standard or double-hi-res images, we always look at the image on a composite monitor too.

Avoid the MacPaint syndrome. Many graphics programs—e.g., Dazzle Draw, MousePaint, and Paintworks Plus—emulate the user interface of the Mac's popular paint program MacPaint. In these programs, you don't see the entire working area, or page, all at once. When you start, the drawing window usually displays the upper left, not the center of the page. You may choose to create a graphic that's only the size of the visible screen, but be aware that in these programs, beneath the palettes and menus, there's more room to work. Use the full-screen command to be sure your image is where you want it to be on the page.

We hope you find these tips helpful. Judging from the work you've been sending us, you might be able to teach us a thing or two. Do you have any graphics tips? Send them to us, and we'll share them with other *A+* readers.

P.S.

You may have noticed some errors in a program listing that appeared in this column last month. A corrected version of that listing—which allows you to create a "slide show" for "Graphics Gallery" submissions—appears on page 118 of this issue. ✚

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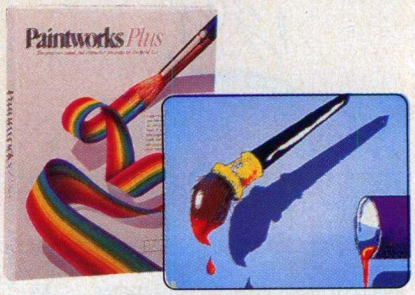

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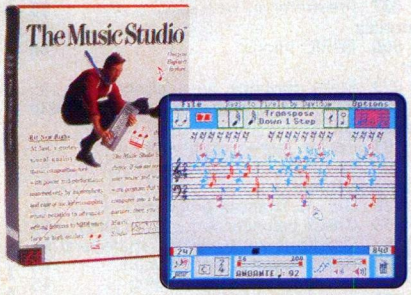

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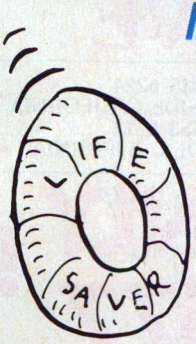
ENTERTAINMENT

GAMEPORT

BY BOB LINDSTROM

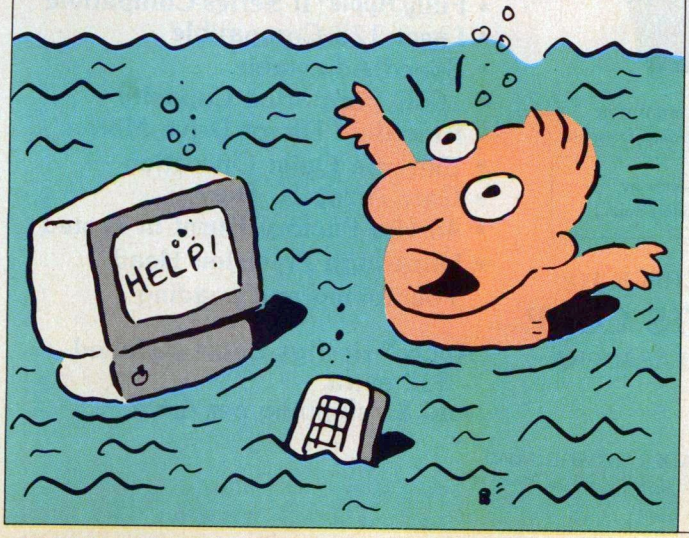
Gameport and its readers to the rescue! Here's help for the desperate gamers who've lost their way and their self-esteem in Apple adventure-land.



HELP AND HOW TO FIND IT

You see a lot of life writing a column such as "GamePort." People share their hopes and dreams, their triumphs and defeats, their hints and cheat techniques. But a disturbing amount of international desperation is abroad in the land, a shadow of confusion, frustration, and decaying self-image that stretches from the International Date Line to Rugby, North Dakota (the geographical center of North America).

A letter from Craig M. Deyerle of the United Kingdom (Cranwell, Sleaford, Lincs.—to be exact) is typical: "I am writing in hope that you may be able to help. I am surrounded by adventure games that I am unable to solve . . . . I didn't think that I was stupid until I started playing these games. Honest, I'm an electrical engineer!" I'm sure our hearts go out to Craig as those adventure-game piles grow larger and larger and his self-esteem shrinks smaller and smaller.



No less touching is the disorientation suffered by Deglin F. Kenealy of Covina, California. "Somebody help me, please! I have played and played and played Thomas Disch's Amnesia and have just about finished. The only problem is that I can't finish . . . . Please, I believe that I have tried just about everything I can, and I am still lost. Please, a hint, any hint, just give me one more chance before I forget where I am." Calm yourself, Deglin, and stop at a gas station. The attendant should be able to tell you where you are.

The attendant probably won't be able to help Deglin finish Amnesia, however, or get Nate Sequeira of Baton Rouge, Louisiana, through King's Quest II or, even, see that Bob Lindstrom survives Bureaucracy.

So, how do you reduce the amount of adventure-game frustration in the world? There are several techniques, some obvious, some obscure. But, face it, hunting hints is as much a part of adventuring as typing LOOK MAILBOX.

First, appeal to fellow adventurers. Users' groups almost always count one adventure-game fanatic among their membership. Look for the man or woman with the 90° elbows and constantly twitching fingers. Chances are you'll find a kindred spirit eager to lend aid to a colleague.

When a pal can't rush to the rescue, perhaps a publisher can. Most software publishers maintain customer-support lines. If the publisher releases game software as well as productivity packages, those support lines aren't just for folks who want to globally reformat a spreadsheet. For the cost of a long-distance telephone call, a friendly employee will save your nerves and your self-respect with a clever hint or a straight-out solution. Look for support-line numbers in the game documentation.

Still other companies, such as Infocom, Electronic Arts, and Activision, make hint sheets available for purchase. Products range from a hint sheet for a couple of dollars to cover postage and handling to full-blown illustrated booklets such as Electronic Arts' new $12.95 *The Destiny Knight Cluebook* for The Bard's Tale II.

Apple owners with modems have an advantage. Computer bulletin boards are excellent

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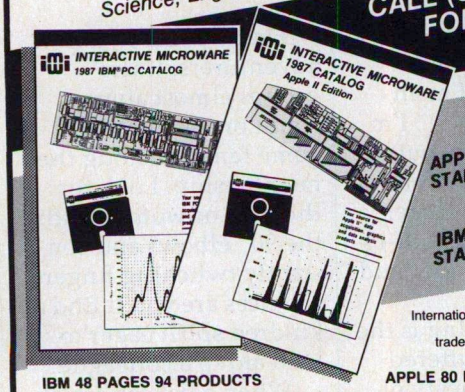

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GAMEPORT

places to leave imploring help messages. On a heavily used board, you might have an answer within a single day. That is fast relief. How much

'Please, a hint, any hint, just give me one more chance before I forget where I am.'

hair can you pull out in a 24-hour period?

Apple owners with modems and a little disposable income may want to subscribe to CompuServe, the on-line database service, and join The Gamers' Forum (type GO GAMERS), one of the most useful sources of adventure-game help and information. The forum is populated by serious, hard-core gamers, including some *A+* software reviewers, all of whom are generous with encouragement and suggestions.

Also on CompuServe is The Electronic Gamer (type GO TEG), a one-stop source of software reviews and, more important, walk-throughs of popular adventure games. Stuck? Stopped? Petrified in your tracks? The Electronic Gamer walk-throughs won't waste your time with coy

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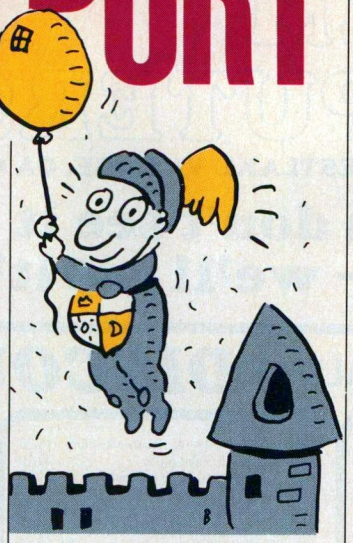

hints. Here are complete, detailed solutions for games from Zork I to Wizard's Crown.

Finally, another new source of adventure-game solutions is *Questbusters—The Adventurer's Newsletter*, edited by Shay Addams. In addition to reviews and readers' classified ads (sell or swap those old adventure programs), *Questbusters* now is publishing its own walk-throughs. Recent issues included solutions to Essex, A View to a Kill, Moonmist, and Ultima IV's Stygian Abyss. A subscription is $16 for 12 issues, available from Questbusters, 202 Elgin Court, Wayne, PA 19087.

WE WANT TO HELP, TOO

We're reaching assembly-line volume on hints from "GamePort" readers. This month the emphasis is on role playing. With Ultima V on the horizon, some of you may feel pangs of guilt that you've never completed Ultima IV. No problem—here are a few "innovative strategies" to help you through Lord British's previous epic.

First, we hear from a reader identified only as The Knight of Arcana, a person who either wishes to remain pseudonymously anonymous or had parents who were role-playing fanatics. No matter, The Knight, who crusades from Cypress, California, submits this Ultima IV goody:

"Start two steps north of Lord British's castle with a balloon (you get this when you exit the dungeon Hylothe). Then, when the winds are right, drift to the west. Soon, you will be one step south of the dungeon Covetous. When you are over the swamps, (X)-It the balloon—do not try to descend first." The computer thinks you're in the air, the Knight explains, but you can walk on the ground, blithely traversing lava and swamp.

After you're on the ground, says the Knight, enter the dungeon . . . (D)escend down the ladders to level 9. Incidentally, this is the only time you should be in a dungeon without using the standard balloon-landing technique and then (X)-It from a balloon routine. Turn right and take one step forward. A chest appears, but when you (G)et it, the chest doesn't disappear. Keep taking chests until your greed is sated. Use a Mage's exit spell back to the balloon and navigate it over a grassy area. Descend, leave the balloon, and life returns to wealthy normality (at least what passes for normal in Ultima).

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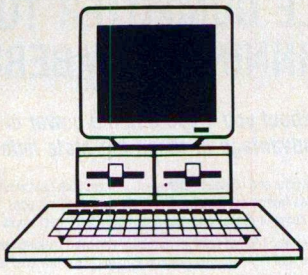

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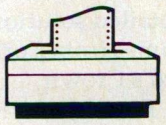

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GAMEPORT

Michael Cho of Holmdel, New Jersey, has a slightly less complex and considerably more capitalistic technique for grabbing the Ultima IV gold. "After getting the mystic armor (in the oak grove in Empath Abbey, beneath the tinker) (W)ear armor for players 1 through 8. Then search, and you will get more Mystic Armor. This is like a steady source of income because you can sell it and keep coming back for more."

"A poisonous swamp will not poison you if something else is over it," claims Brian Lallatin of Virginia Beach, Virginia. "If you can entice a monster to stand on the swamp and you attack it, leave the chest there at the end of the fight. You can then enter the swamp as often as you need with no risk."

Brian also had a pithy comment on the cheat ethic. "My dictionary says cheat is 'to devalue something by deceit or fraud.' I suppose that by cheating, I get less of a game/challenge than I paid for . . . but I did pay for it. And if I enjoy deciphering the game more than 'honorably completing' it, who gives a chip?"

Uriah Blatherwick (a role-playing adventurer's name, if ever I've heard it) offers a way to get free healing. "To receive this healing, just ask Lord British about his health. He will respond that he is fine and ask you if you require healing. Just say 'yes,' and you will receive full hit-point healing (not for poison)."

THE BARD HAS A NEW TUNE

Milind Limaye of San Antonio, Texas, snickered to himself after reading a "GamePort" suggestion on how to increase character status in The Bard's Tale: "If you intend to cheat (yes, I said the C-word)," he wrote, "at least do it properly!"

Not the kind of man to smirk and run, Limaye generously included a disk with a public-domain character editor for The Bard's Tale, which he programmed with S.R. Fennell. This ingenious and polished programming effort (which includes its own musical score) allows frustrated Bard's Tale fans to distribute gold, hit points, stamina, objects—whatever—and all according to their deepest desires.

For those who can't find a copy through their local users' group, Mr. Lemaye will provide a copy to all "GamePort" readers for $2 to cover disk and postage. The address is Milind Limaye, 12838 Country Ridge, San Antonio, TX 78216.

And don't forget to keep those high scores, hints, and C-word discoveries coming to GamePort, *A+*, 11 Davis Drive, Belmont, CA 94002.

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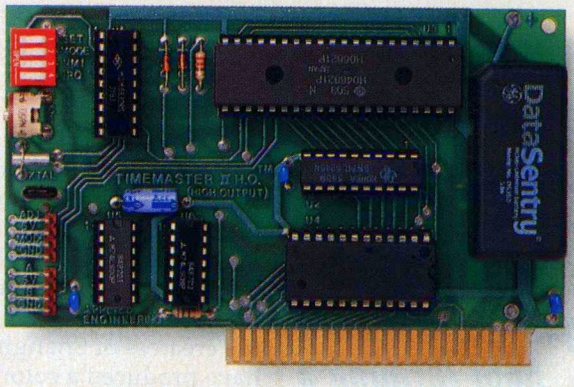

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ENTERTAIN

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ADDICTIVE TILES

Shanghai is a new game from Activision for the IIGS that has its roots in a much older game, Mah-Jongg. Using Mah-Jongg tiles as the inspiration, the creators of Shanghai have produced a colorful and addictive product.

Structurally, Shanghai is a game of matching, somewhat like Concentration, but instead of cards you use tiles, and, instead of laying them face down, you have them stacked in an uneven pyramid. Only tiles that are free on at least one side can be removed. You must find two matching tiles and click on them both to remove them. Since the entire game is played with the mouse, you never have to type to play the game.

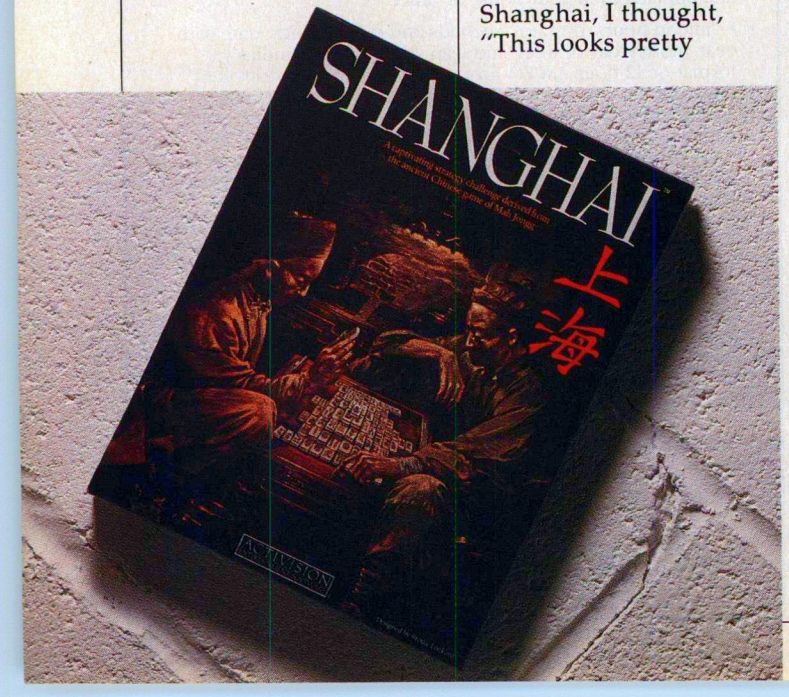
When I first saw Shanghai, I thought, "This looks pretty strange. It's not an arcade game. It's not really a strategy or adventure game. It's probably a game I'll grow bored with almost immediately." I was right—and I was wrong. It isn't one of those other types of games, true, but I didn't grow bored. In fact, I found myself playing one game after another in an endless string, something like a chain smoker with his cigarettes. I couldn't explain it. It was just fun.

One aspect of the program that enhances it is the use of the colorful, alien, and interesting Chinese tiles Even though the game is not Mah-Jongg, its cultural heritage is still reflected by the tiles, which are in suits—bam (bamboo), dots (which originally repesented coins), and crak (a suit of Chinese characters). Special tiles represent the four winds; the four seasons; red, white, and green dragons; and flowers (orchid, plum, mum, and bamboo).

Each layout is an irregular, unique stack of 144 tiles called a dragon that the computer can generate quickly. As in similar games, some dragons are unwinnable, whereas others seem fairly easy. The IIGS graphics are clear and colorful, and it is pretty easy to see if a tile is free by looking at its three-dimensional border. You can't see the tiles beneath the surface, and the dragon is five tiles deep at the center. Unfortunate placement of hidden tiles can sometimes mean the difference between winning and losing, just as it can in solitaire.

Speaking of solitaire, you can play Shanghai as a solitaire game, but it can also be competitive. In fact, you can play in teams (any number of players can remove tiles from the same dragon), tournaments (each player plays on a separate, but identical dragon, with or without time limits), and challenges (two players take turns removing tiles from the same dragon, but with a time limit that can range from 10 to 60 seconds per move). Solitaire and team games can be saved for completion at a later time, and the top ten tournament scores are recorded to disk .

To win the game, you remove all the tiles from the dragon. If you get stuck, the program offers various types of help. On the pull-down menu called Help, you'll find options to back up a move, to peek beneath a



tile, to show all remaining moves one at a time, or to start the game over. Also there is information on how to play, strategy information, and a guide to the tiles. Sometimes you just can't see the next move, and, rather than give up or save and return later, you can use the Show All Moves command—a good way to verify that you are, indeed, stuck and need to begin a new game.

The average game took me anywhere from 15 minutes to half an hour, making it a short, but pleasant diversion. A single session of multiple games, however, sometimes stretched for a couple of hours. The disk includes eight preset games that are guaranteed winnable.

About the only drawback to playing Shanghai is that you may get eyestrain from searching for matching tiles as you play game after game. Not that the graphics aren't crisp and clear—they are, but it's a game that invites you to say, "Just one more time." Shanghai is a pleasant surprise and great fun on the IIGS.

Rusel DeMaria

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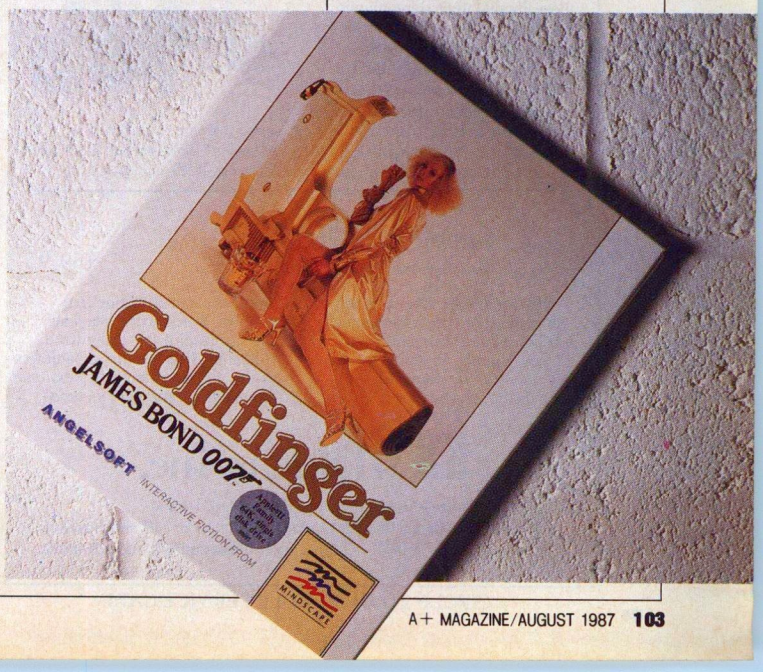
How many of you saw the movie *Vampire Penguins of the North*? Or that other drive-in classic *Slash 'n' Chop Sock Hop*? Well, if you did, you're among the millions of fictional moviegoers who plunked down their hard-earned Zorkmids to make (fictional) sleazo movie producer Buddy Burbank extraordinarily rich. Although his work took no major artistic steps in any direction, Mr. Burbank churned out more than 600 B movies for an eager public, in the process making a household name out of Buck Palace, star of the phenomenally successful "fighting mailman" series. Able to live in palatial Malibu splendor, Buddy Burbank and his wife Hildegarde spent many happy hours in their mansion, Hildebud, surrounded by loving family, obsequious friends, and amusing souvenirs from Buddy's movies, not the least of which was a large statue of Buck Palace adorning the lawn near the front door.

Since everything must come to an end, the Big-Movie-Producer-in-the-Sky first called Buddy and then Hildegarde to their final rewards. In her will, Hildegarde bequeathed the entire Burbank estate to the one nephew she and her husband really loved. But there was one condition: He would inherit everything only if, within the span of 12 hours, he could find ten objects from Buddy's life and films that were cleverly hidden throughout Hildebud.

As you've probably figured out by now, this is not the lead story in the National Enquirer; it is the premise of Infocom's latest all-text interactive-fiction game. And it is yet another treasure hunt, in the manner of the company's previous classics, Zork and Leather Goddesses of Phobos. Lest this comparison sound even remotely like a criticism, remember that the treasure-hunt format is particularly well suited to adventure games, and no-



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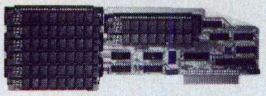

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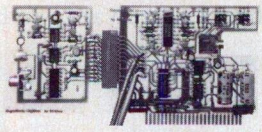

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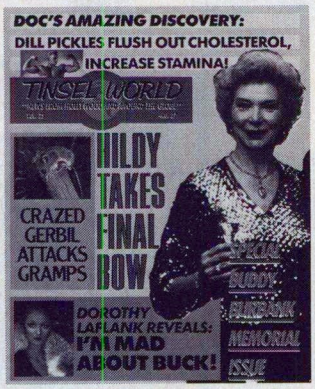
CIRCLE 241 ON READER SERVICE CARD

REVIEWS



body does them better than Infocom.

When you play Hollywood Hijinx, you assume the role of the nephew, and the Burbank wealth is a mighty carrot to dangle in front of your face, giving you sufficient motivation to overcome the obstacles and collect the ten treasures. If you need more incentive, there's every possibility that your odious Cousin Herman will have a crack at the fortune if you don't succeed. Merely remembering some of the horrid tricks he used to play on you when you both were younger still makes the hair on the back of your neck stand on end.

You won't let Herman get a nickel, will you? Of course not. But do you think that the treasures are going to be easy to find? If you do, guess again. You'll have to solve many devilish puzzles to get the rewards, examining every inch of the Burbank estate from the beach to the bomb shelter, from the private screening room to the basement computer room, from the fireplace to the hidden wall safe, from the upstairs bathroom to the downstairs grand piano.

And how are the puzzles, you ask? Fair and fun, in the standard Infocom manner. The best ones are the puzzles that relate directly to the B-movie theme. My favorite was the one in which I had to get the diamond ring from the scale model of Tokyo depicting a scene from the movie *Atomic Chihuahuas from Hell*. And the funniest has to be the one about Buddy Burbank's long-lost horror-film masterpiece, *A Corpse Line*. This one is, quite literally, a scream.

The most frustrating (and tedious) puzzle can be the one relating to the hedge maze in the garden, so here's a hint: Don't try to map it immediately; wait until you're further along in the game.

The Burbank wealth is a mighty carrot to dangle in front of your face.

Hollywood Hijinx was written by "Hollywood" Dave Anderson, a new (and welcome) author to the genre. If you already enjoy interactive fiction, you won't want to miss Hollywood Hijinx. If you're new to interactive fiction, Hollywood Hijinx might be a good place to start. Who knows? Maybe the amazing,

REVIEWS

lucky palm-tree swizzle stick that comes for free in the game package will help you find hidden treasure in your own home!

Donald Oliver

HOLLYWOOD HIJINXS
Infocom
125 Cambridge Park Drive
Cambridge, MA 02140
(800) 262-6868, ext. 17A
LIST PRICE: *$39.95*
REQUIRES: *Apple II Plus, IIe, IIc, or IIGS; 48K RAM; one 5¼-inch disk drive. Can work with mouse.*

CIRCLE READER SERVICE NO. **402**

TURNING GOLD INTO LEAD

When the new 007 movie, *The Living Daylights*, premiers at the local theater, I expect to be in the audience. But with my Apple, I can do better than just "see" Bond; I can "be" Bond.

Goldfinger, a text-adventure game from Mindscape, brings you back to the golden days of Bond and puts you in Sean Connery's shoes. Based on the movie of the same name, Goldfinger pits 007 against international financier and all-around evil genius Auric Goldfinger, who plans to bomb—atom bomb—Fort Knox and its gold reserves.

Goldfinger, the game, begins quite differently from *Goldfinger*, the movie. The game dispenses with shocking experiences, card games, and painting the town red, er, gold. Instead, this adventure starts in Switzerland with a car chase, *the* car chase.

The Aston Martin DB5

Goldfinger brings you back to the golden days of Bond.

growls with purpose as you weave through hairpin turns up the side of an Alpine mountain. Beside you, Tilly Masterson, out to avenge her sister's murder, alternately grabs your arm and the dashboard. Behind you, several Mercedes Benz autos filled with gun-toting Koreans are catching up. Calmly, you open the armrest, only to realize you have no idea which button activates which special feature. A quick examination gives you enough of a hint, and the chase is on.

Mindscape's last 007 offering, A View to a Kill (see the review in the May 1986 issue of *A+*), proved disappointing in three respects: poor descriptions; poor parser structure; and a nasty habit of misplacing objects, which I suspect is poor programming. Goldfinger improves on the descriptions, keeps the same parser structure, and maintains the habit of misplacing objects.

The descriptions bring Bond and characters to life and pull the settings into focus. The parser structure remains the same, which means it seems a step behind that of Infocom, Trillium, and Synapse/Brøderbund games.

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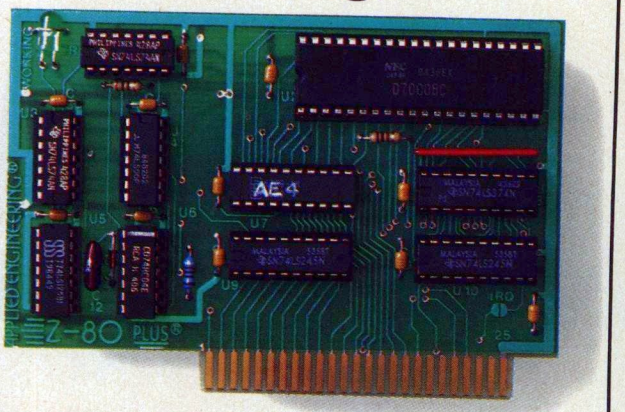

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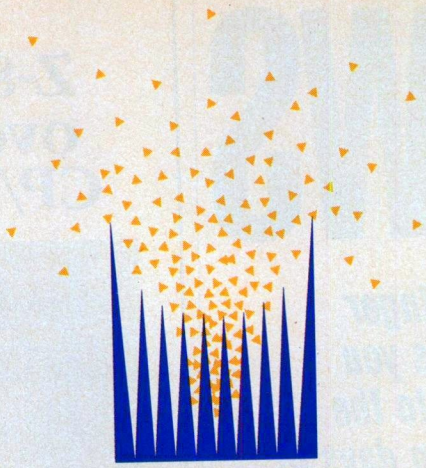

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CIRCLE 212 ON READER SERVICE CARD

REVIEWS

Perhaps the biggest objection I have is to the uncanny ability of the program to misplace objects. Let me give you an example: You (aka Bond) have been knocked unconscious after trying to elude the Koreans in your DB5 and awaken tied to a table in a warehouse. The game tells you, "You step out of the DB5 at the fork."

DB5? Fork? What's going on here? I'll tell you what is going on—poor quality control. The same thing happened in A View to a Kill. I guess Mindscape has problems with cars. Incidentally, I managed to duplicate this error several times.

So what's one little sentence? Not much, actually, but I keep wondering, what else am I missing? I've not seen this kind of error in an Infocom or Synapse/Brøderbund adventure or in Mindscape's other adventures, Rambo and The Mist. So far, the 007 adventures are two for two.

Goldfinger shows some improvements over A View to a Kill, and the puzzles and plot twists are enough to keep veteran secret agents on edge. For those of us who appreciate the Bond movies but want more in an adventure game, however, Goldfinger turns into Leadphalange.

Russ Lockwood

GOLDFINGER
Mindscape
3444 Dundee Road
Northbrook, IL 60062
(800) 331-5046
In IL (800) 654-3771
LIST PRICE: *$39.95*
REQUIRES: *Apple II Plus, IIe, IIc, or IIGS; one 5¼-inch disk drive. Does not work with mouse.*

CIRCLE READER SERVICE NO. **403**

BY DEDINI

LAUGHTRACK

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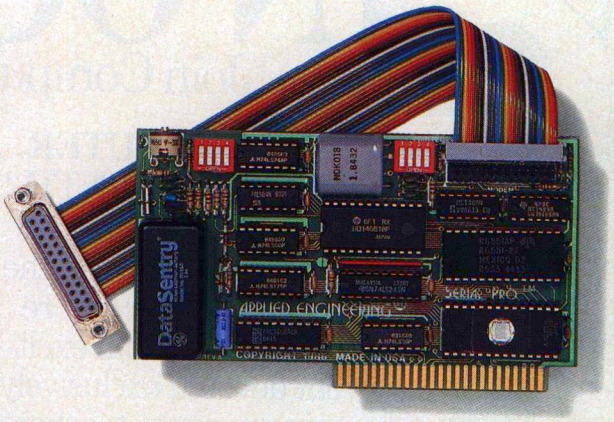

Serial Pro is a powerful multifunction card for the Apple IIe, II+, IIGS and compatible computers. Serial Pro combines a powerful serial port for interfacing to a printer, modem or other serial device, with a full function clock/calendar. Serial Pro's serial port is compatible with virtually all letter quality and dot matrix printers, including Apple's Imagewriter and Imagewriter II, and can communicate with the fastest external modems at baud rates from 50 to 19,200.

Set up is easy, because unlike other cards, there are no switches to program serial parameters or disks to use. Serial Pro has a built-in setup screen that allows all parameters to be set. And on-screen help that makes it super-easy. An on-board battery stores your selections for over 20 years, but you can change them at any time. Serial Pro is the perfect upgrade for Super Serial card owners looking for more performance or a built-in clock.

Serial Port Features • Fully Super Serial Card compatible but more versatile and easier to use • Compatible with printers • Compatible with modems • Prints graphics to printer (without software) in normal mode, 90° rotation, double size, side by side, and black/white inversion • Variable word length, number of stop bits and parity selection • Crystal controlled circuits are used to provide ultra accurate baud rates.

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Serial Pro comes complete with manual, cable and instructions for connecting to all the leading printers and modems.
Serial Pro **$159**

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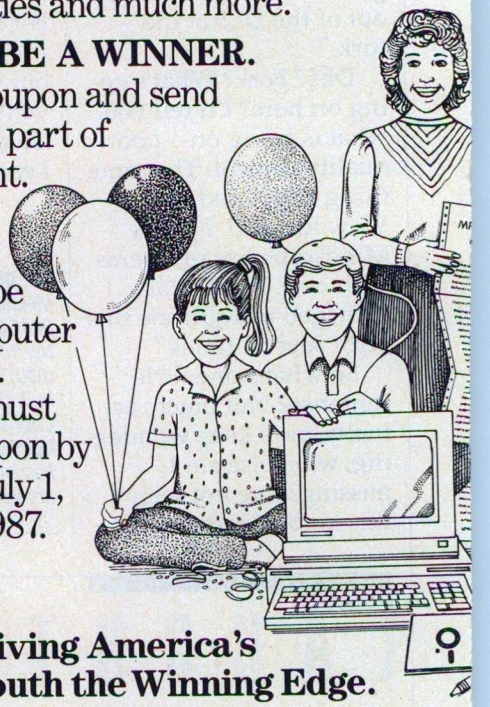

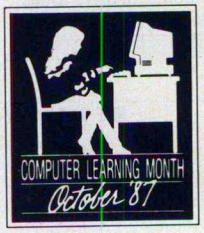

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CIRCLE 218 ON READER SERVICE CARD

TIPS AND TECHNIQUES

Readers share tips for the II

REINKING RIBBONS

Your "New Life for Old Ribbons" article in the June issue was good, but I have a different technique. Instead of spraying the worn ribbon with WD-40, use a few drops of stamp-pad ink. Simply allow the ink a week to soak in and spread out on the ribbon. I am still using my original three ribbons after six years with no print-head problems on my C. Itoh Prowriter.

Michael E. Meehan
Martinez, GA

FORM-LETTERS HELP

If you use form letters in Apple Writer, here is a tip for you. Instead of using the Control-P DO commands to retrieve each form letter you want from a disk, you can substitute the help-screen menu with your own form-letter menu.

To access the help screen, you type open-apple and ?. The program then transfers you to a file named HELP80 on the ProDOS Apple Writer disk, or HELP8E (if you're in 80 columns) or HELP4e (if you're in 40 columns) on the DOS 3.3 Apple Writer disk.

All you need to do is change the help screen. Type in your list of form-letter filenames, along with corresponding numbers. Following the menu, add the commands to execute Control-P DO for the selected letter in the sample program listing (below, left).

You need not delete your help menu. Keep your form letters on a different disk, and whenever you type open-apple/?, make sure your form letter disk is in the disk drive.

David Martin
Pte-Gatineau, Quebec, Canada

```
START PND
PPR (CTRL-L)   {see note below}
PPR
PPR            FORM LETTER LIST MENU
PPR
PPR            1. CREDIT REFUSAL LETTER
PPR            2. CREDIT ACCEPTANCE LETTER
PPR            3. AFTER SALES THANK YOU LETTER
PPR
PPR            PRESS RETURN TO EXIT
PIN            ENTER YOUR SELECTION (1 - 3) : =$A
PSC /$A//
PGO QUIT
PSC /$A/1/
PDO NO.CREDIT
PCS /$A/2/
PDO YES.CREDIT
PCS /$A/3/
PDO AFT.SALE THANK YOU
PGO START
QUIT PPR
```

NOTE: To type in the CTRL-L you must press CTRL-V, CTRL-L, VTRL-V. The CTRL-L simply tells the computer that you want the screen cleared before the menu screen is shown.

IIGS AUTO-REPEATER

I discovered this tip by accident: Holding down Control/Delete on a IIGS gives you an auto-repeat feature. Since the Control and Option keys correspond to the buttons on a joystick, you can use the Control/Delete combination for rapid fire in shoot-'em-up games. Doing so produces the same effect as pressing and releasing the joystick button repeatedly, and you can change the speed with the Control Panel repeat-speed setting.

S. Corley
Glenview, IL

KARATEKA

Here is something very interesting I have just recently discovered. If you insert Karateka label-side down, you can play with the game screens mirrored, top to bottom.

Roderick Ochoa
Waynesboro, PA

Please send your Apple II tips to A+, 11 Davis Drive, Belmont, CA 94002; ATTN: Tips and Techniques. We will pay $25 for each tip we publish, so be sure to include your name, address, and social security number.

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Computer Press Association

On April 7th, 1987, A+ Magazine received the prestigious Citizen America/Computer Press Award as the Best Computer Magazine. Chosen from a list of impressive entries from the Apple, IBM and general interest magazines, A+ Magazine was recognized as the Best Magazine of 1986, providing useful information to its targeted audience.

At the awards ceremony, it was said that "A+ Magazine is a lively, fast-paced magazine that is well designed and edited to invite Apple II users into its pages, satisfying their informational needs. In particular, A+ did an outstanding job in providing well rounded coverage of the new Apple IIGS..."

We are very proud and honored that our professional colleagues have recognized our achievement in creating the #1 Apple II Magazine, confirming A+ as the "Reader's Choice" for all Apple II users.

This award as the "Best Computer Magazine" confirms that A+ Magazine is the information source for all Apple II owners and users.

A+

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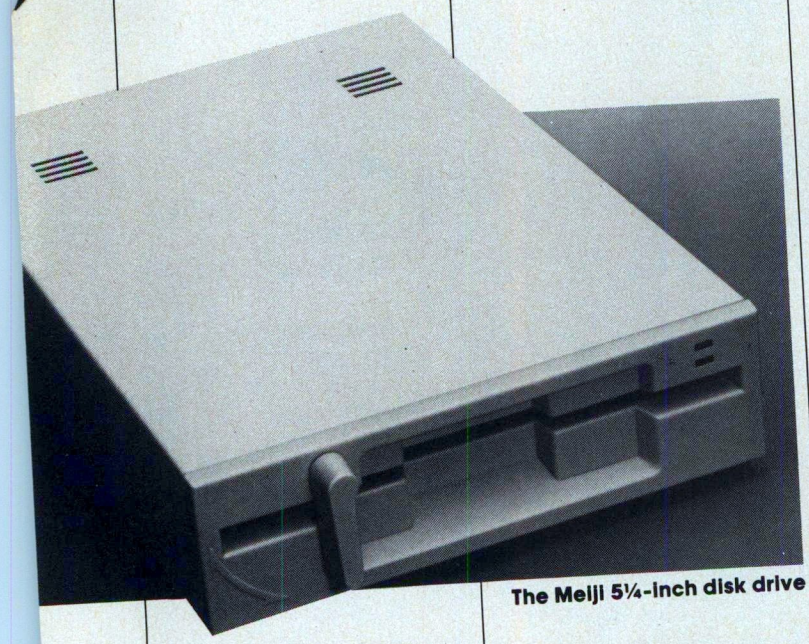

The Meiji 5¼-inch disk drive

MEIJI DISK DRIVE

Kinson Products Corporation has released a 100%-compatible, 5¼-inch disk drive for Apple II computers. The disk drive features quiet operation, a gate-array IC design, and ultra-high-precision head positioning and loading. An optional special cable is available for using the drive with Apple IIc or IIGS computers.

List Price: $69; IIc/IIGS cable, $12

Kinson Products Corporation
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Pasadena, CA 91101
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CIRCLE READER SERVICE NO. **501**

VISUALIZER IIe

Visualizer IIe is a professional-quality, business-graphics software package that lets users produce a variety of different graphics either from AppleWorks spreadsheets or from data entered into its own database facility. Graph formats include pie, line, point, scatter, bar and 3-D bar charts. Most graph types can accommodate six separate data ranges with 52 points in each data range, and each graph can be customized—for example, users can pull out slices of pie charts. The software can automatically scale axes, or users can define them, and users can place text and titles anywhere using a variety of font styles. Users can display graphics in color on a color monitor in the double-high-resolution mode and print them in color, using an ImageWriter II. (Also available is a special IIGS version called Visualizer IIGS, which takes advantage of the computer's mouse, windows, super-high-resolution graphics, and speed.)

List Price: $89.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive; 80-column display. ProDOS; not copy-protected; does not work with mouse; printer and AppleWorks optional.

PBI Software, Inc.
1163 Triton Drive
Foster City, CA 94404
(415) 349-8765

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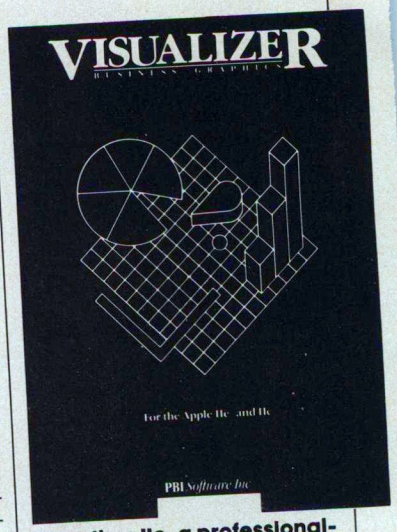

Visualizer IIe, a professional-quality business-graphics software package from PBI Software

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My Letters, Numbers and Words is designed to encourage children ages 2–6 to learn the alphabet, numbers 1–10, and the concept of words. The program features multi-level activities; special audio effects; and brightly colored, animated graphics.

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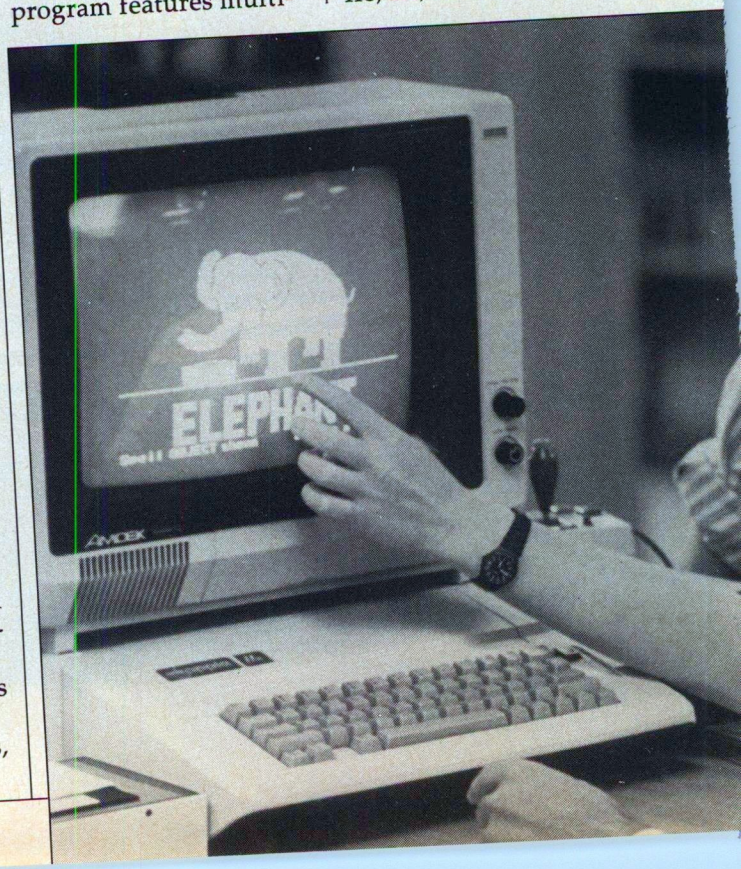

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SCHOOLMASTER III NETWORK SYSTEM

SchoolMaster III is an educational network system that features both a disk network and a print spooler. The disk network provides fully independent access to software through a proprietary solid-state disk emulator and allows sequential and simultaneous loading of software using one or two Apple-compatible disk drives. The print spooler accepts and stores data from each user and then prints the stored data in the order received, thereby providing automatic and simultaneous "printing" for each user on one or two common printers without interruption of the disk network. Each system comes with a RAMdisk that can contain two floppy diskettes' worth of software, a print spooler, and cables.
List Price: $2195 for 4 users, $3495 for 16 users
Requires: Apple II Plus, IIe, or IIc; 5¼-inch disk drive; serial printer port
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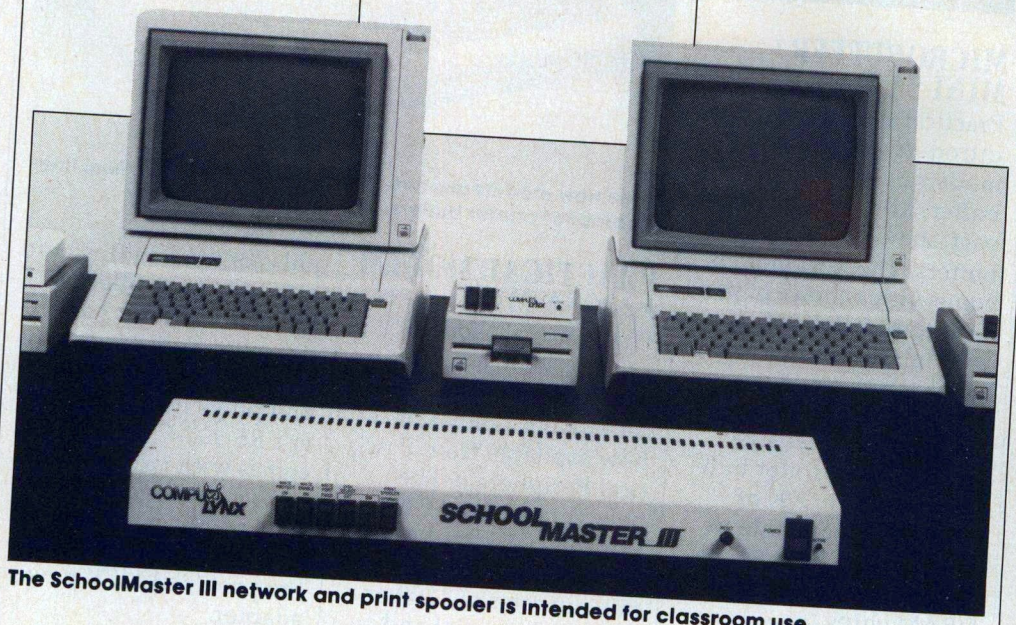
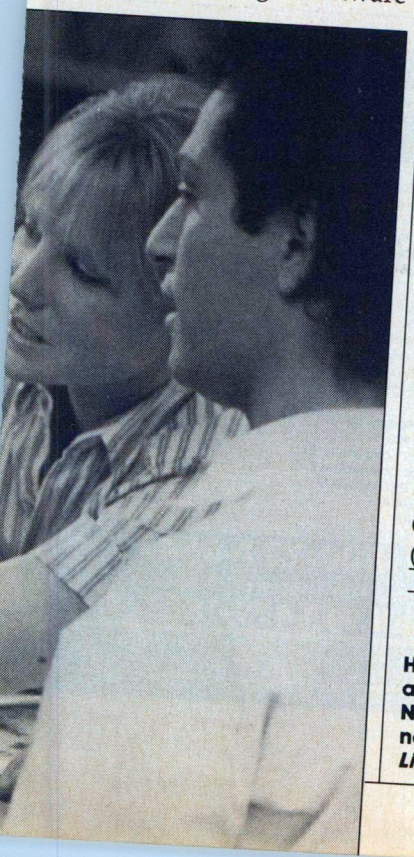
(818) 407-1985
CIRCLE READER SERVICE NO. **504**

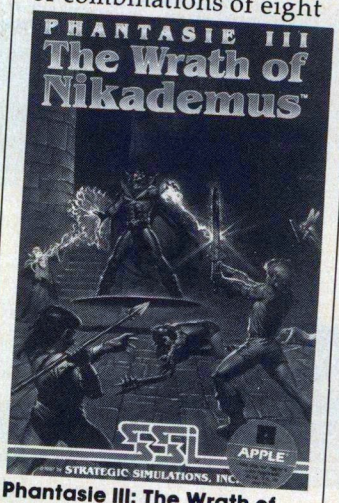


The SchoolMaster III network and print spooler is intended for classroom use.


Howie Mandel learns the alphabet using My Letters, Numbers and Words in the new comedy movie *Walk Like a Man*.

PHANTASIE III: THE WRATH OF NIKADEMUS

Strategic Simulations has released Phantasie III: The Wrath of Nikademus, a title in its Phantasie adventure-game series. Phantasie III is a multiple-character, role-playing game in which players assemble a party of up to six adventurers. Players can create wizard elves or fighter dwarves or combinations of eight races and six classes of characters that include humans, elves, dwarves, thieves, warriors, and wizards. They can also reuse characters from earlier Phantasie games. Characters use spells and weapons to invade difficult terrain; escape dungeons; destroy demons; and confront and destroy the evil power of the Dark Lord, Nikademus. The program features more strategy and combat options, better graphics, more potent magic spells, more potent magic spells and a faster playing speed than previous Phantasie games.
List Price: $39.95
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one 5¼-inch disk drive. Copy-protected; does not work with mouse.
Strategic Simulations, Inc.
1046 N. Rengstorff Ave.
Mountain View, CA 94043
(415) 964-1353
CIRCLE READER SERVICE NO. **505**



Phantasie III: The Wrath of Nikademus

PIPELINE

HARDWARE

MICROBUFFER/ MINI 512

Practical Peripherals has introduced three new models in its Microbuffer/Mini line of compact, stand-alone printer buffers. The new models come with a choice of parallel-to-parallel, serial-to-parallel, or parallel-to-serial interfaces.

Intended for large graphics and data-intensive outputs, the printer buffers come with 32K of memory, expandable to 512K, and use either special 256K or 1-megabit DRAM chips.

List Price: with 32K, $99 each

Practical Peripherals
31245 La Baya Drive
Westlake Village, CA
91362
(800) 991-8200
(818) 991-8200

CIRCLE READER SERVICE NO. **506**

Three new models are available in the Microbuffer/Mini line of compact printer buffers.

PRACTICAL MODEM 1200SA MINI

The Practical Modem 1200SA Mini, a pocket-size version of the Practical Modem 1200SA, is now available from Practical Peripherals. The new version has all the features of the full-size modem, including transmission rates of 1200 or 300 bps, auto-dial and auto-answer capabilities, and full Hayes compatibility. It also features error-free operation over common telephone lines, storage of up to ten telephone numbers, menu-driven configuration, pulse or tone dialing, and a volume-controlled speaker. The unit has a two-wire, full-duplex, direct-connect interface and plugs into a computer's RS-232-C interface. It comes with two modular jacks for voice and data calls and operates either on a 9V battery or with the provided 117V power adapter.

List Price: $199

Practical Peripherals
31245 La Baya Drive
Westlake Village, CA
91362
(800) 991-8200
(818) 991-8200

CIRCLE READER SERVICE NO. **507**

SOFTWARE

f/22 PRESS LOTTERY SOFTWARE

f/22 Press has released updated versions of two of its lottery programs—Lotto Wheeler and Win.

Lotto Wheeler, Release 2.0, is an enhanced version of the company's wheeling system for picking prize-winning Lotto numbers. The original program generated a 38-game wheel from any 16 numbers between 1 and 48. Release 2.0 provides four additional wheels—12 × 6, 12 × 42, 14 × 40, and 18 × 42—in addition to the original 16 × 38 wheel. The numbers can be selected by users or randomly by the computer. The company is also offering a custom programming service that will produce any wheel a customer can define.

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Panasonic KXP-1592/1595 ... $419/519
QUME LetterPro20+/Sprint1400* ... $592/899
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Disk Drive Controller card ... $35
HARD DRIVES AVAILABLE ... CALL$

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CIRCLE 126 ON READER SERVICE CARD

PIPELINE

Release 2.0 of Win, a program designed to beat any lottery or Lotto game, lets users pick up to 20 numbers between 1 and 99. The new release also handles lottery numbers of up to five digits instead of three or four, as did the earlier release. Users can buy the program at a reduced price if they promise to pay the company 1% of all winnings over the first $100,000 they win by using the program.

List Price: Lotto Wheeler, $24.95; custom service, $100 minimum; Win, $99.95; reduced price, $19.95

Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM; one 5¼-inch disk drive. Not copy-protected; does not work with mouse.

f/22 Press
P.O. Box 141
Leonia, NJ 07605
(201) 568-6250

CIRCLE READER SERVICE NO. **508**

ANT FARM

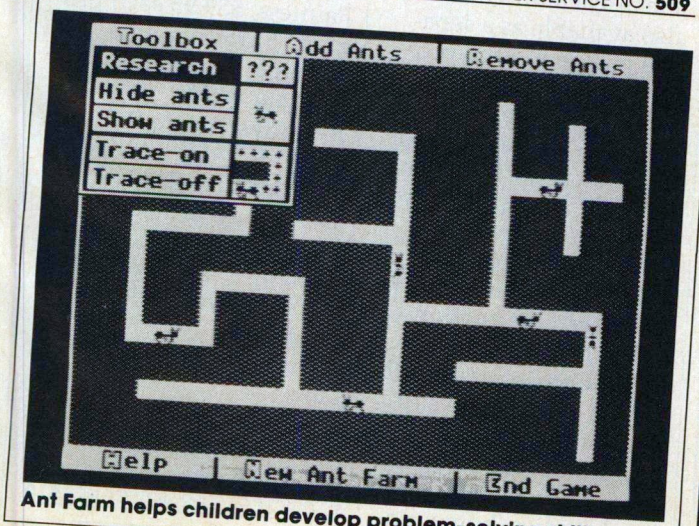
Designed for children in grades 3 and up, Ant Farm helps children develop problem-solving skills by challenging them to find the "work stations" of nine ants inside an ant farm. Each ant has its own pattern of travel that students must gauge accurately in terms of direction and length to place ants correctly. The program offers several kinds of challenges and difficulty levels along with help in an on-screen Toolbox. The software encourages students to examine assumptions using trial and error, teaches them to identify similar situations, and shows them the importance of making projections based on information they have gathered.

List Price: $59

Requires: Apple II Plus, IIe, IIc, or IIGS; 64K RAM; one 5¼-inch disk drive. ProDOS; copy-protected (comes with one backup); does not work with mouse; comes with teachers' guide.

Sunburst
Communications, Inc.
39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
In NY (800) 221-5912
(914) 769-5030

CIRCLE READER SERVICE NO. **509**



Ant Farm helps children develop problem-solving skills.

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Unidisk 3.5 (IIe/IIc)	$319
Color RGB Anlg Monitor	$399
Color Monitor IIe	$299
Color Monitor (IIc/IIGS)	$299
Monochrome Monitor IIe	$109
Mnchrm Monitor (IIc/GS)	$109
Imagewriter II w/cable	$499
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GS-RAM 256K	$139
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Ramworks III 1 MEG	$279
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Ramfactor 512K	$229
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Heavy Duty Pwr Supply	$ 59
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Z-RAM Ultra 2 1 Meg	$309
Z-RAM Ultra 3 256K	$259
Z-RAM Ultra 3 1 Meg	$359
Applied Vision	
Future Sound	$179
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AST Ramstack 256K	$ 99
AST Ramstack 512K	$139
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CIRCLE 103 ON READER SERVICE CARD

PIPELINE

Two educational-software packages for youngsters and adults, from Educational Activities, Inc.

EDUCATIONAL ACTIVITIES SOFTWARE

Educational Activities has introduced two educational-software packages—Algebra Made Painless, and Consumers and the Law.

Algebra Made Painless is a six-disk package that provides a comprehensive introduction to elementary algebra. It contains six units—Signed Numbers, Number Properties and Variables, Solving Equations Requiring One Step, Equations Requiring More Than One Operation, Solving Systems of Linear Equations, and An Introduction to Solving Algebraic Word Problems—each of which is also available as a separate program. Each program uses high-resolution graphics; multiple explanations of algebraic algorithms; internal reviews; and randomly generated problems that provide students with interactive, self-paced instruction.

For grade 7 through adult, Consumers and the Law is designed as supplementary material for courses in consumerism, economics, business law, legal studies, home economics, and American history. Topics covered include rights and problems of consumers, sales contracts, legal and warranty protection, decision making, and actions and options available to consumers. The three-disk tutorial program tests problem-solving and thinking skills in actual case studies of various consumer problems, and its automatic Management System analyzes students' skills in specifics, interpretation, application, and generalization. An accompanying booklet reinforces and extends the material and includes keywords, comprehension activities, and a glossary.

List Price: Algebra Made Painless, $59.95 each program, $295 complete package; Consumers and the Law, $179

Requires: Apple II Plus, IIe, or IIc; 48K RAM; one 5¼-inch disk drive. ProDOS; copy-protected (all program disks accompanied by one backup each); does not work with mouse.

Educational Activities, Inc.
P.O. Box 392
Freeport, NY 11520
Written inquiries only

CIRCLE READER SERVICE NO. **510**

BEAGLE COMPILER NEW!

by Alan Bird
$74.95–for any Apple II (64K minimum)

MACHINE LANGUAGE SPEED FOR APPLESOFT PROGRAMS
Boot the Beagle Compiler and then run practically any Applesoft BASIC program from disk. The program will be converted *on the spot*, in seconds, to run at machine language speed–*fast!*

HOW FAST IS IT?
It depends on your original Applesoft program. 5 to 7-times speed is about average. *10-times speed*–and up–is not uncommon.

HOW EASY IS IT TO USE?
Real easy. Say you've got a normal (slow) Applesoft program named "ABC" on a disk. Simply type "RUN ABC" and within seconds, ABC is running at machine language speed!

You can make changes to your program (using Applesoft) and immediately re-run it at machine language speed.

Beagle Compiler author Alan Bird leaves for work.

"Beginning programmers love it. Experts are amazed."

❑ **THE BEAGLE COMPILER IS QUICK!**
Compiling takes a few seconds at the mos
Many programs compile in under a second

❑ **EFFECTIVE**
Most programs compile without alteration. Syntax errors, illegal GOTO's, etc., are *automatically trapped* before a program runs.

❑ **COMPACT AND CONVENIENT**
A compiled program actually occupies *less* memory and *less* disk space than its Applesoft original. Saving programs in compiled format prevents snoopers from reading or changing your original code.

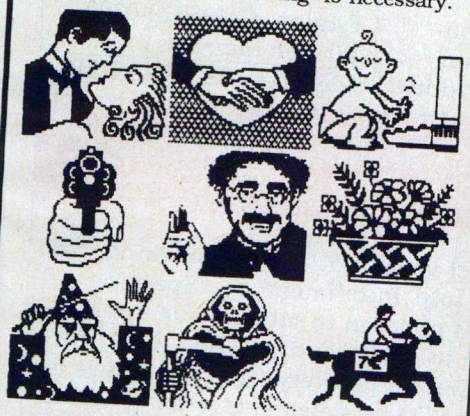
❑ **PRODOS-BASED AND UNPROTECTED**
Compile Applesoft programs to and from floppy disks, hard disks or 3.5" disks.

❑ **LICENSING NOW AVAILABLE**
Now you can sell your Applesoft programs in compiled format. After you purchase the Compiler, the fee is only $50 per year.

MINIPIX DISK #3 NEW!

$29.95–200 Pictures for The Print Shop™

Minipix Disk #1, #2 and #3 each contain 200 nifty "graphics" for your *Print Shop* cards, banners and signs. All pictures are ready to use–no "converting" is necessary.



MINIPIX DISK #2 NEW!

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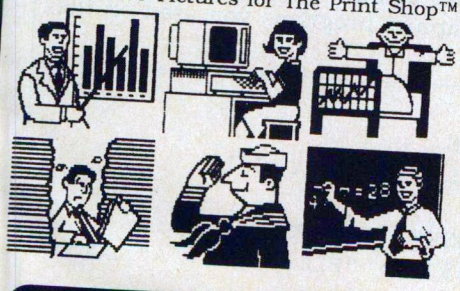
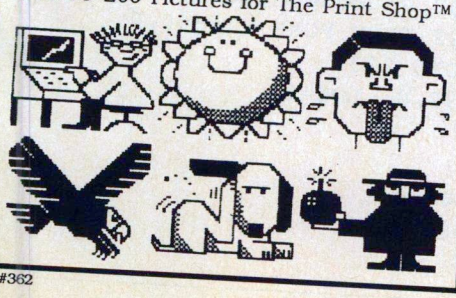


MINIPIX DISK #1

$29.95–200 Pictures for The Print Shop™

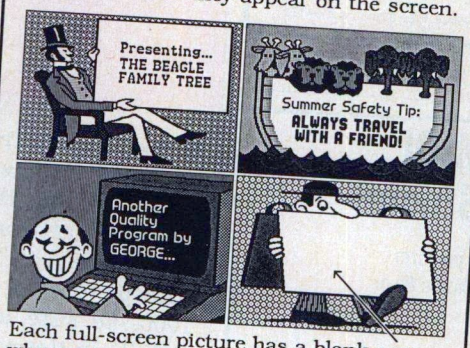


BEAGLE SCREENS NEW!

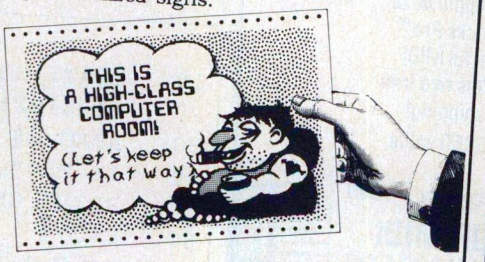
$34.95–Apple IIGS, IIc or 128K IIe

Beagle Screens will get *your* message across–anything from "Happy Birthday" to "Hands Off"– in a unique and colorful way. Use our pictures to add a touch of class to your Apple programs and presentations. Or just use them to show off your Apple.

You get *forty* captionable full-screen pictures on disk. Half are automatically animated when they appear on the screen.



Each full-screen picture has a blank area where you can add your message. We make it *easy* to add your own words and to create colorful on-screen "slide shows". Or use your printer to create unique personalized signs.



(Printing requires any standard printer dump software like Triple-Dump.)

AUTO-ANIMATION

Animation gives your messages extra punch. Twenty Beagle Screen pictures are *automatically animated* as soon as you load them onto the screen.

TRIPLE-DUMP

by Mark Simonsen and Rob Renstrom
ProDOS and DOS 3.3
$39.95–for any version of Apple II

Triple-Dump lets you use your dot-matrix graphics-capable printer and any Apple II+, IIe, IIc or IIGS print:

- Hi-res graphics
- Lo-res graphics
- 40-column text
- Double hi-res graphics
- Double lo-res graphics
- 80-column text

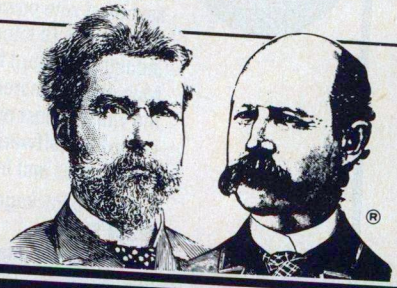
Print "hard copies" of almost any image. No programming knowledge is required.

Or, Applesoft programmers can use Triple-Dump's routines as part of their own BASIC programs.

Triple-Dump offers special effects like picture cropping, rotating and magnifying, plus the ability (on many printers) to adjust the print density.

BANNERS!

Triple-Dump's bonus big Banner Maker lets you print giant (8"-high letters) text banners on any printer.



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AD #362

CIRCLE 148 ON READER SERVICE CARD

...w-How

...om Weishaar's monthly newsletter for knowledge-...sers. It's thin but packed tight with Apple II lore, ...rs, tips, advice, and solutions to *your* problems. ... to other Apple II publications, ***Open-Apple*** has the ...iew-idea-per-issue ratio, the clearest writing, the funniest ...ons, the longest index, the *only* warranty (all your money back ...u're not satisfied), and it takes up the least shelf space. The only ...ing it doesn't have is the most subscribers. Yet.

II cue #9

Some IIgs users are having unclaimed interrupts (SYSTEM ERROR #01) occasionally crash their systems. The following commands allow you to turn interrupts on and off. When off, the control panel and some other advanced IIgs features are inaccessible:

```
10 REM disable interrupts
20 POKE 768,120 : POKE 769,96 : CALL 768

10 REM enable interrupts
20 POKE 768,88 : POKE 769,96 : CALL 768
```

For more information, see "Insert system disk and..." in the April 1987 ***Open-Apple***, page 3.18.

From our fan mail:

Open-Apple is enough beyond my reach that a constant challenge presents itself... but that is what grasp is all about, isn't it? Much has been learned, some subtleties comprehended and confidence earned...as reading it is in a class by itself. I thought you would like to know how much you contribute to understanding a fine piece of computing machinery.

Anthony D. Warren
Belleville, Ont.

Thanks for your help—my back issues of ***Open-Apple*** are well-worn from re-reading!

Steven R. White
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'SPEAKING OF GRAPHICS' SLIDE-SHOW PROGRAM CORRECTION

Below is the correct version of a program listing that appeared in the July installment of "Speaking of Graphics." Use this program to submit your Apple II-generated artwork in a self-booting "slide-show" format to the *A+* "Graphics Gallery." Put the names of your pictures in the DATA statements starting at line 1000. Be sure to include the last line, 1900 DATA DONE, in the program. When you send in "Graphics Gallery" submissions, be sure to put your name and the name of the graphics programs you used on the disk label.

```
10   TEXT: HOME
20   L1=8192: L2=16384: LOC=L1
30   READ F$
40   IF F$="DONE" THEN GOTO 500
50   PRINT CHR$(4); "BLOAD";F$;"A";LOC
60   C=C+1
70   IF C=1 THEN POKE -16297,0:
     POKE -16302,0: POKE -16304,0
80   IF LOC=8192 THEN POKE -16300,0:
     LOC=L2: GOTO 100
90   POKE -16299,0: LOC=L1
100  GOTO 30
500  END
1000 DATA picname1
1010 DATA picname2
1900 DATA DONE
```

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Simply tell us about innovative, creative, and successful methods you have used to teach with computers. Entries must be 500 words or less, typewritten and double-spaced. Please include the category, **Classroom Users** *(one person teaching a group of people)* or **Home/Personal Users** *(one person teaching one other person)*. Make sure your entry has your name, address and telephone number.

SEE ADDITIONAL RULES AND REQUIREMENTS ON PAGE 120.

Send your entries to:

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"HOW I USE THE II TO TEACH" CONTEST

CONTEST RULES

See page 119 for further details No Purchase Necessary

1. All entries must be 500 words or less, typed and double-spaced. Multiple entries, mailed in separate envelopes, will be accepted. Include your name, address and daytime/evening telephone number on each entry. Entries become the sole property of *A+* magazine. Mail completed entries to the category you are entering:

Classroom Users:
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"HOW I USE A II TO TEACH"
11 DAVIS DRIVE
BELMONT, CA 94002

Home/Personal Users:
A+ HOME TECHNIQUES
"HOW I USE A II TO TEACH"
11 DAVIS DRIVE
BELMONT, CA 94002

Entries that do not fulfill the above requirements will be disqualified.

2. Contest begins May 15, 1987, and is promoted and advertised in *A+* magazine and related publications. All entries must be postmarked by August 15, 1987, and received no later than August 21, 1987. All decisions will be made by September 15, 1987, and winners will be announced beginning with the November 1987 issue of *A+* magazine.

3. There will be a total of 52 prizes awarded as follows:

A. One Grand Prize for the Classroom User category and one Grand Prize for the Home/Personal User category. Grand Prize is an Apple IIGS system complete with an Apple IIGS courtesy Apple Computer, Inc., AST-VisionPlus Digitizer, Applied Engineering 512K GS Memory Board, MDIdeas SuperSonic Stereo Card, Telex MagnaByte Image Projection System, a KroyKolor printer/photocopier enhancer, and Bose RoomMate speakers. Approximate retail value is $5820 per system.

B. Twenty-five First Prizes for Classroom User category and 25 First Prizes for Home/Personal User category. First Prize is a choice of educational software selected by the editors of *A+* magazine. Approximate retail value of $39 to $100 each. No substitutions for prizes. Prizes are not transferable. Taxes are the responsibility of the winners. All manufacturer's claims or warranties will apply. *A+* magazine makes no claims or warranties for any prizes. Winners may be required to execute an affidavit of eligibility and release. *A+* magazine has the right to reproduce the name, address and likeness of winners in future promotions. *A+* magazine shall have all publication rights in all entries.

4. Winners will be selected by a panel of judges, selected by the publishers, from all submissions that meet entry requirements. Decisions will be based equally upon content, originality, practicality, and results of educational applications described. Decisions of the judges will be final.

5. The *A+* "How I Use The II To Teach" Contest is open to all individuals of at least 18 years of age who are residents of the U.S., its territories and possessions, with the exception of employees (and their families) of Ziff-Davis Publishing Company and its properties, and their advertising and promotion agencies. Void wherever restricted or prohibited by law.

6. For winners list, send a stamped, self-addressed envelope to: *A+* magazine, "How I Use The II To Teach" Contest, 11 Davis Drive, Belmont, CA 94002. Refer to the November and December 1987, and the January 1988, issues of *A+* magazine for winners' names and reprints of winning entries.

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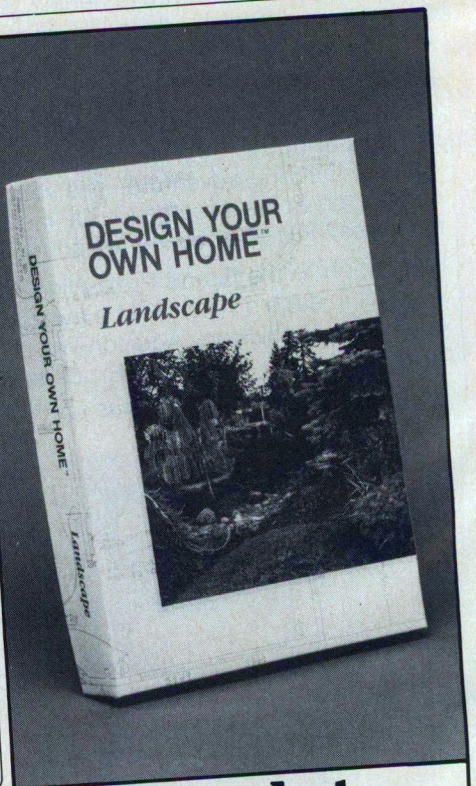

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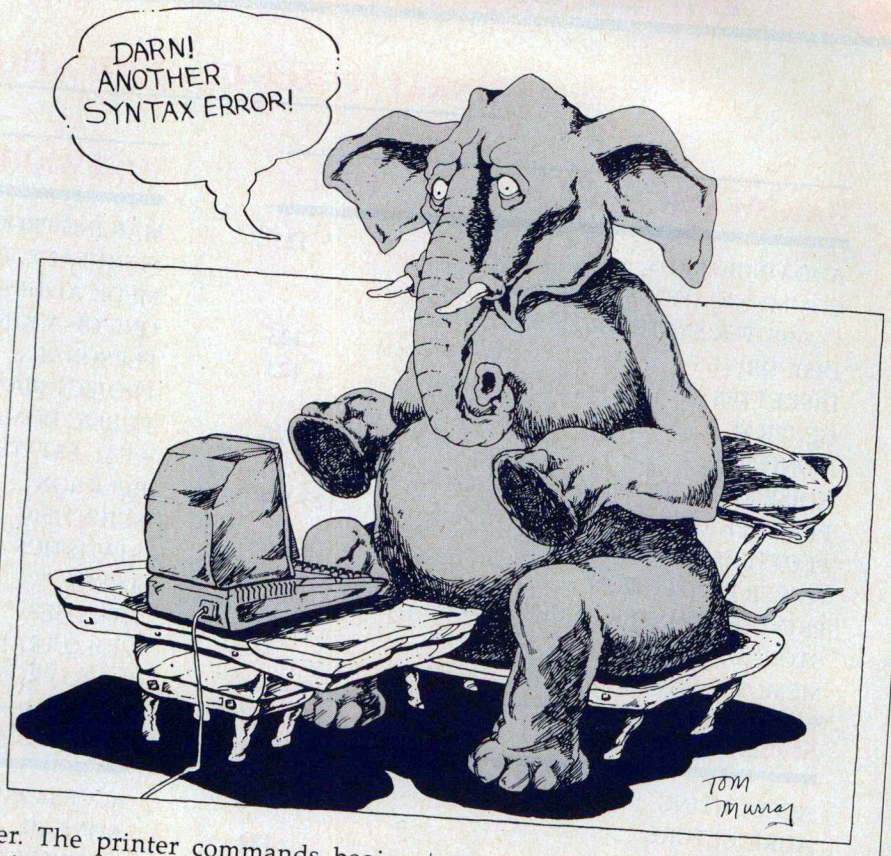

ILLUSTRATION BY TOM MURRAY

PERIPATETIC COMPANY

Q. *I've been using a California Computer System Model 7710 serial-interface card for several years, but it recently stopped working. I can't locate the company, and I've misplaced the manual containing the circuit diagram that I will need to fix it. Can you help?*

Charles A. Mills
Zellwood, FL

A. California Computer Systems, one of the first manufacturers of peripheral cards for the Apple II, is still very much in business. You can contact CCS at 2036 Concourse Drive, San Jose, CA 95131 ([408] 945-0500). It still sells the old 7710, but it now also sells the Model 7711, which is compatible with the Apple Super Serial Card.

If you do have a malfunctioning card from a now-defunct company, you might find the *Apple Seed* books handy. The first volume ($9.95) is a general guide to assembling circuit boards for the Apple II, and the second ($14.95) contains schematic diagrams and parts lists for about 85 different cards. They are available from Nuscope Associates, P.O. Box 790, Lewiston, NY 14902.

SLASHED ZEROS AND DOUBLE-SPACING

Q. *I'm having a problem with my ImageWriter II printer. The command for telling it to print slashed zeros is*

```
PRINT CHR$(27);"D";CHR$(0);CHR$(1)
```

After I send this command, zeros are slashed as expected, but the printer begins to double-space all subsequent output. Is there a solution to this problem?

Mike Durisin
Allen Park, MI

A. You've encountered this problem because Applesoft always forces the high-order bit of a byte to 1 before sending it to the printer. The printer commands beginning with `CHR$(27);"D"` are followed by two data bytes (16 bits), which can affect the settings of 16 parameters the ImageWriter controller program uses. The low-order bit of the second byte, for example, can be set to 1 to enable slashed zeros, as you obviously know.

Since the high-order bit of the first data byte is also set, however, the parameter associated with it, namely "send line feed after carriage return," is enabled. Since most printer-interface cards already send a line feed after a carriage return to advance the paper by one line, your output will be double-spaced. (The high-order bit of the second data byte has no side effect because it isn't actually used.)

The easiest way to solve the problem is to restore single spacing by sending the Carriage Return Only command:

```
PRINT CHR$(27);"Z";CHR$(128);CHR$(0)
```

For more information on the commands the ImageWriter II can handle, refer to the *ImageWriter II Technical Reference Manual* (Addison-Wesley, 1986).

IIGS TECHNICAL-INFORMATION SOURCE

Q. *I need some technical information about my new IIGS. Specifically, I want to know what the new system monitor commands are and what the new IIGS input/output soft-switch locations are. Can you help?*

Gary Siebert
Dexter, MI

A. The best source of this information is the *Apple IIGS Firmware Reference Manual*. A preliminary draft of this manual is available from the Apple Programmer's and Developer's Association (290 SW 43rd Street, Renton, WA 98055; [206] 251-6548). The manual will be published in book form later this year by Addison-Wesley Publishing Company.

Please send your questions and problems to Rescue Squad, A+, 11 Davis Drive, Belmont, CA 94002. Because of limited space, we aren't able to publish responses to all inquiries we receive.

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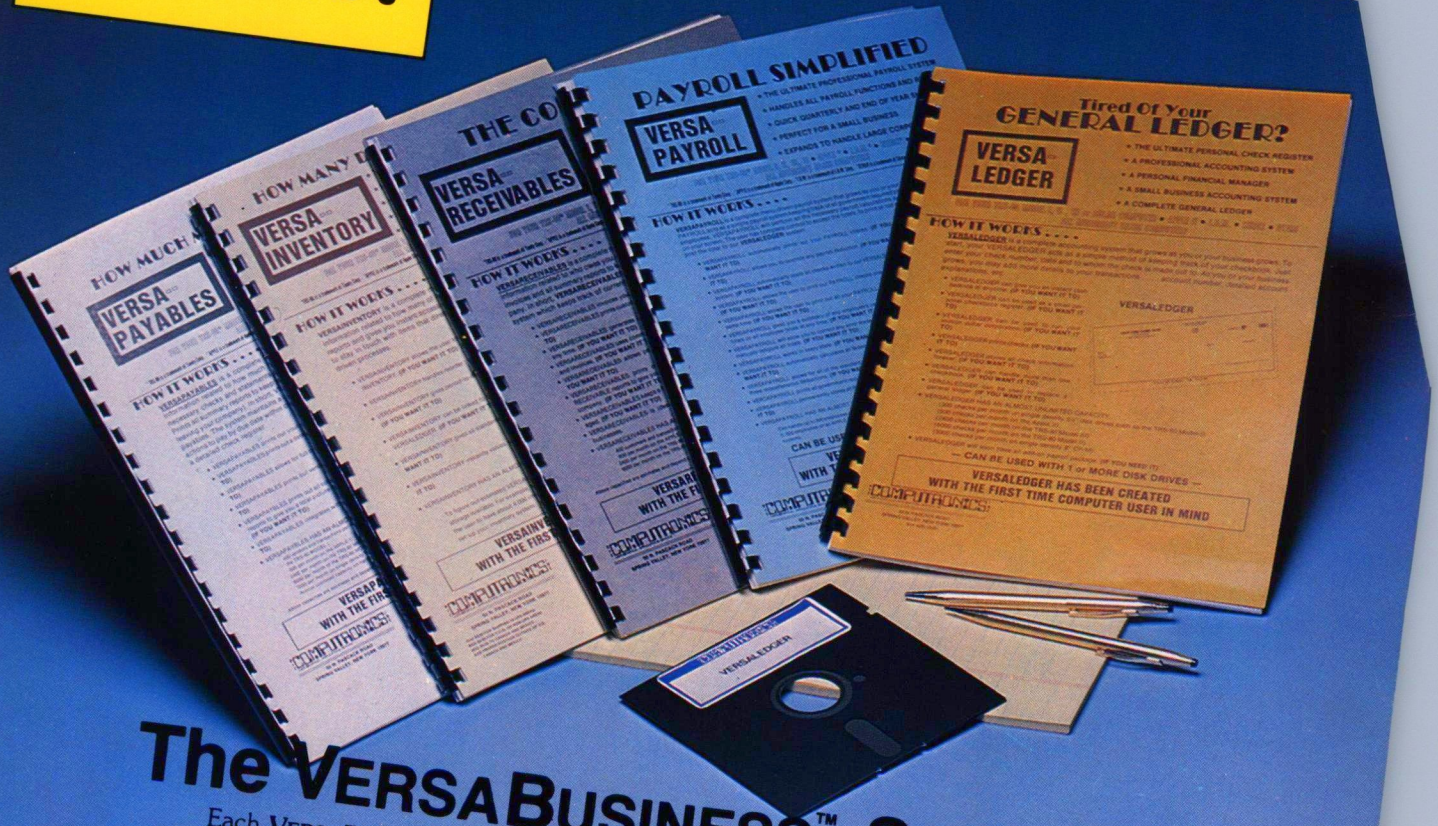

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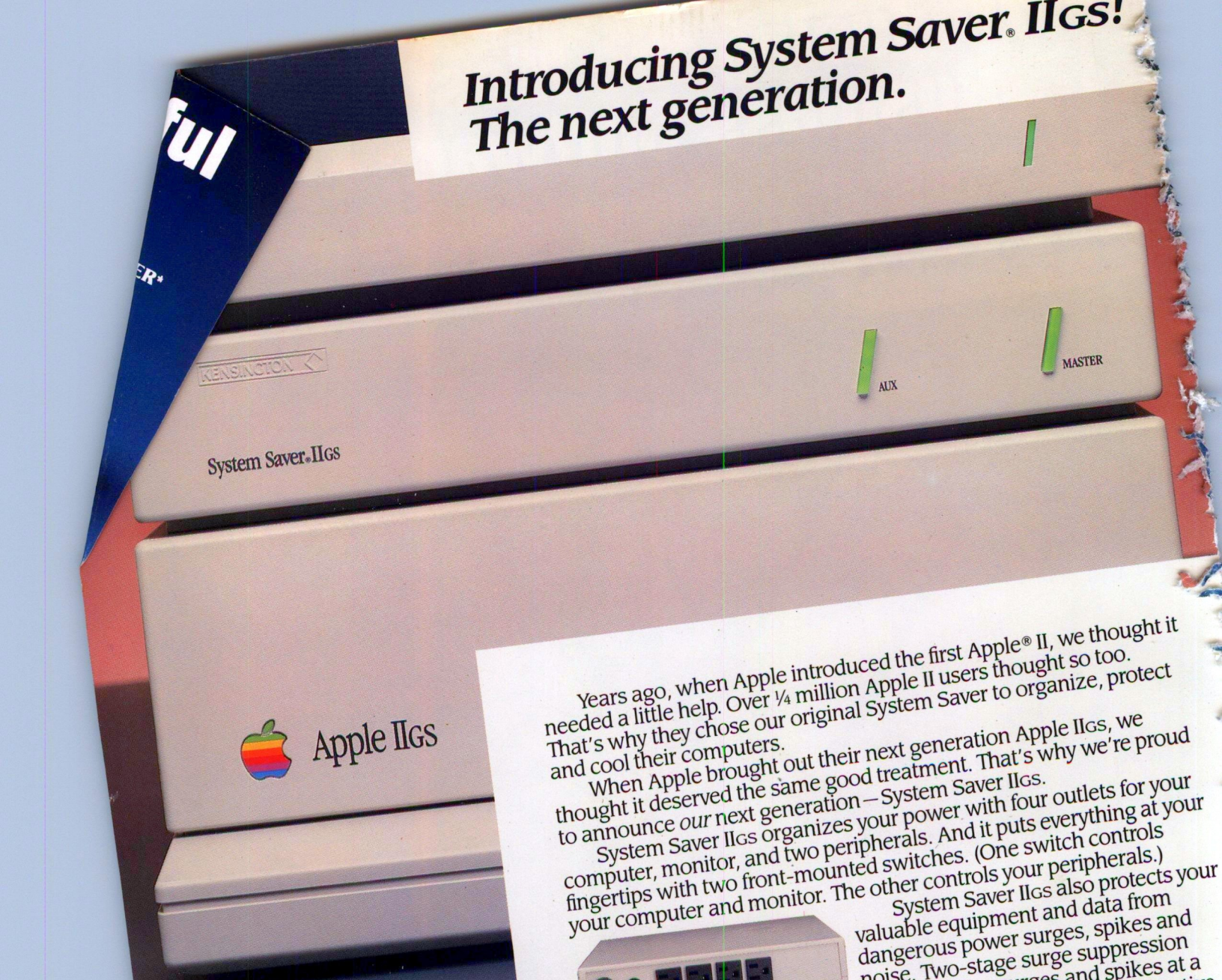

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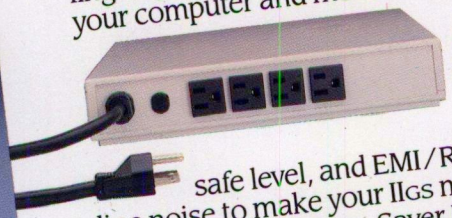

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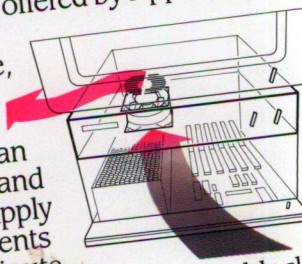

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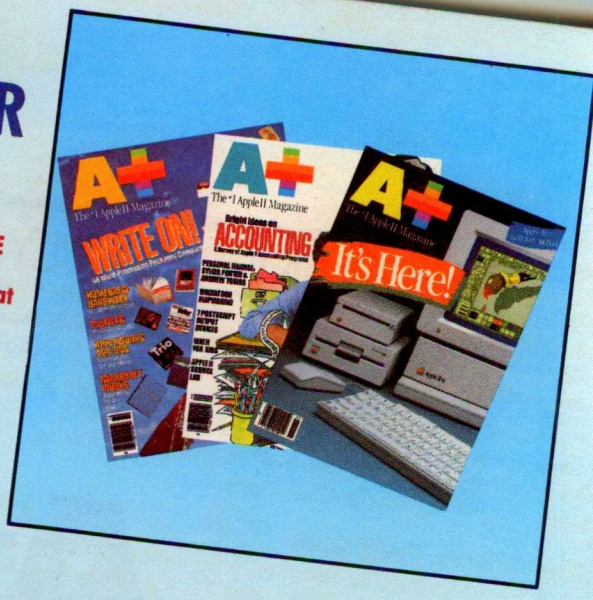

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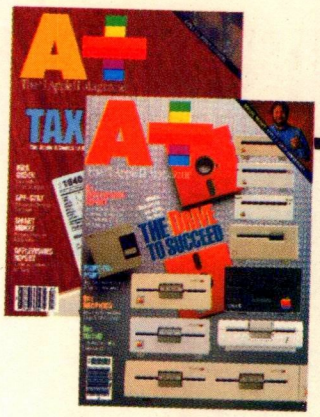

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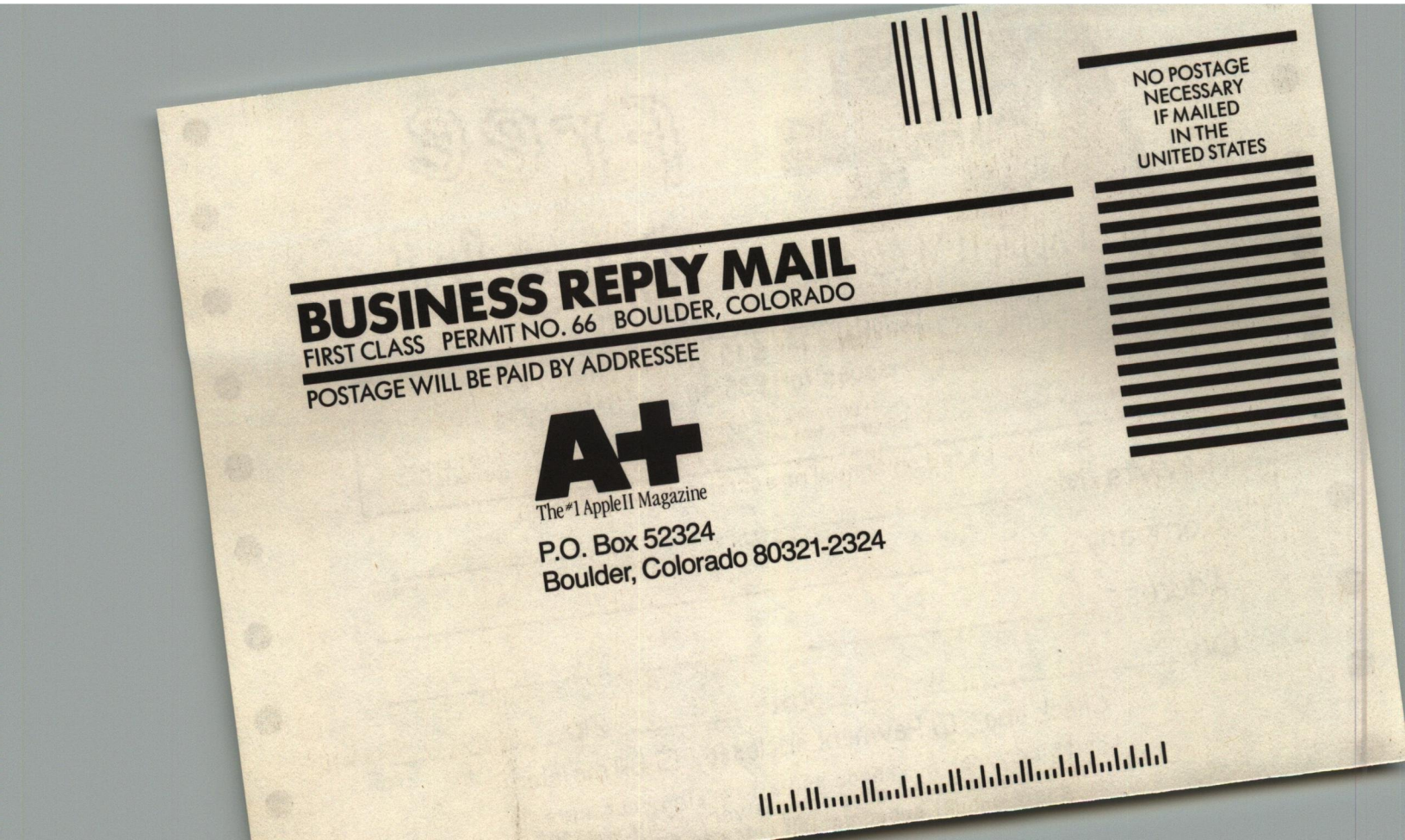
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